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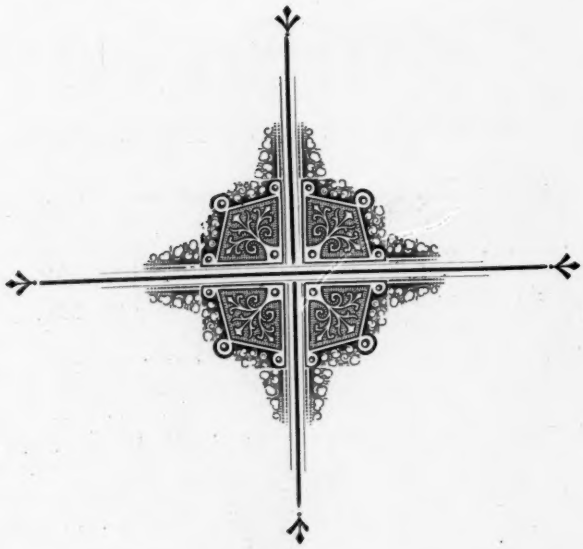

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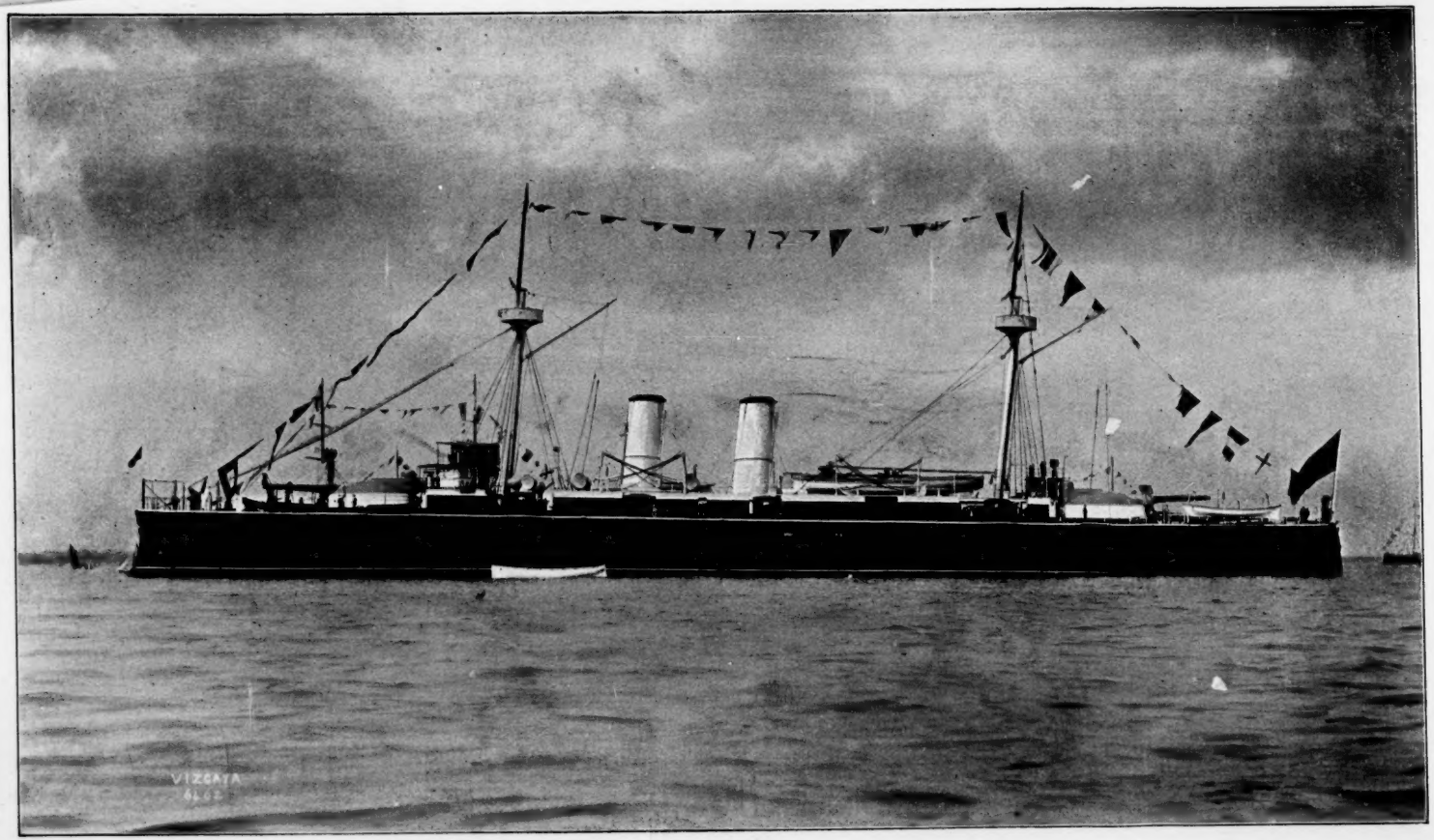

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SPANISH FIRST-CLASS ARMOURED CRUISER **"VIZCAYA,"** 7,000 TONS, 13,000 I.H.P.

THE JOURNAL
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VOL. XLII. APRIL, 1898. No. 242.

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GOLD MEDAL PRIZE ESSAY.

Subject:

"THE PROTECTION OF COMMERCE DURING WAR."

By Commander G. A. BALLARD, R.N.

"*Oportet Vivere.*"

PRELIMINARY REMARKS.

THE subject given for treatment in this essay is of paramount importance to the country. A successful overthrow of British commerce would inevitably entail the overthrow of the Empire, for without it England would be deprived not only of her wealth and power, but her population would be without the actual immediate necessaries of life by the stoppage of their seaborne food supplies—circumstances which render her position unique in history—and the steps taken for its protection may therefore logically be considered as the most essential of the safeguards under which our existence as a nation continues.

To attain this protection effectively the initial requisite is sufficient battle-ship power to prevent an enemy undertaking aggressive operations in force with any hope of success; and, as long as we have this, our food and raw material at any rate ought to find their way here if we are able to pay for them, either in British or neutral ships.

Even with this first step secured however, arises the question of providing adequate safety for our vast and varied general trade on all seas; for the loss or serious reduction of this, if less immediate in its results than the deprivation of daily bread, would in the end prove not less disastrous, as on this depends our wealth and credit, and thence all our power and prosperity.

It is a much discussed question as to how far the transfer of this trade to neutral flags might be effected in war; but, unless the British ships carrying it were also transferred—a proceeding surrounded by great difficulties—the actual proportion of the whole thus changing nationality

could not be a very large one. Great Britain carries considerably more than 50 per cent. of the whole world's ocean traffic, and even the combination of all other countries would be unable to produce a sufficiency of shipping and seamen to take more than a comparatively small part of this out of our hands. Allusions are frequently made to the successful destruction of the American mercantile marine by the intrinsically feeble force represented in the "Alabama" and other Confederate cruisers, and inferences drawn supposed to be applicable to our own position, but the two cases are by no means parallel. At the time of the American Civil War this country was in particularly favourable circumstances for the work of supplanting American shipping, not only on account of the numerical adequacy of our own, and the almost unlimited capacity we possessed for its rapid increase, but also because, as Sir G. Clarke has pointed out in the *United Service Magazine*, certain economic influences in connection with the U.S. navigation laws were working to our advantage.

The total amount of American commerce which thus changed hands, moreover, was only a small fraction of that of the entire globe; whereas that now in our possession, as just noted, represents more than a half, and its supersession by other flags would consequently throw more than double work on every foreign trading vessel afloat if trade in general was to continue on any scale at all—a tax on their capabilities utterly beyond attainment. To attempt to build the requisite number of ships would be the work of years, even with all the appliances at the command of other countries, entailing besides an immense financial outlay on what would certainly be a very speculative investment. The complete annihilation or even considerable reduction of our commerce by war is therefore apparently not an emergency to be seriously apprehended so long as we hold the preponderating power on the sea.

That some of this trade, however, would find its way into neutral bottoms, in the event of an outbreak of hostilities involving this country with a maritime Power may, we think, be regarded as fairly certain, and where the whole is so great the transfer of what was even only a small part relatively might be actually a serious loss. To reduce this more or less inevitable loss to its lowest limits by any and every means would therefore be desirable, and it is here that the questions of national insurance, etc., come in with the others. These, however, are matters of an economic and financial rather than a naval nature, and therefore outside the true scope of this essay, which we presume to be the strategical and tactical operations of our fleets, necessary for the protection of the commerce actually under the British flag during war, not the steps requisite to prevent its reduction by other means than the direct attack of the enemy's ships.

At the same time the strategy upon which the attainment of the first of these objects depended should, if possible, be so framed that it would assist in accomplishing the second by preventing as far as possible any circumstances arising which would render it inexpedient, even if not actually risky for shippers to send cargoes under the British flag. If

this inference is correct, it appears, therefore, reasonable to think at the outset that the system of convoys cannot be upheld, for even the most perfect arrangements on this basis must entail a great loss of time, which of course means loss of money, in addition to a general inconvenience and disruption of routine by which mercantile interests all over the world would suffer, and which they would avoid as far as they possibly could by availing themselves of neutrals. Furthermore, it is difficult to see how the very large trade carried in our ships between foreign ports could be included in convoys at all, unless we built something like five hundred cruisers, while there is the tactical consideration that large fleets of any sort would certainly attract raiding torpedo-boats, etc., if near the coast, and dispel all doubts as to the nationality of the steamers by day or night, a most important point; and it would usually be very dangerous for the protecting cruisers to open fire if an enemy once got fairly in amongst them after dark, from the risk of hitting the ships under their charge. In this essay, therefore, the alternative systems of attaining the object will be considered as far as we are able.

Those who have thought on the matter at all will probably agree that the necessary basis of any protection whatever must be a sufficient superiority in battle-ships on our part to destroy, capture, or blockade in their own ports the main squadrons of the enemy as in former wars, which in itself would constitute the chief source of safety to our shipping, and without which it would be idle to talk of commerce existing at all. But as detailed ideas for carrying out this work would involve the consideration of all the strategy of a war, it lies beyond the scope of the essay to offer them, except in generally noting the fact that unless successfully effected, it would be useless to attempt anything else.

It obviously follows, however, that the more thoroughly their duty of watching the enemy is performed, the greater this protection will be, and, indeed, the opinion is apparently held in some quarters that this is all that is required. If blockades could be made absolutely reliable in effect, of course no further steps would be necessary; but all experience goes to prove the contrary, and more or less leaky ones are apparently the most we must be prepared to accept. The escape of single cruisers will, it seems likely, generally be possible from the majority of ports, even if somewhat difficult and dangerous, and an enemy determined on making every effort to suppress our trade would probably find it worth his while to occasionally attempt the same, even though a large proportion of his cruisers fell into our hands. As long as they remain shut up in harbour they are useless, while if they get to sea there is always the chance of their effecting considerable damage before capture, if they are captured at all. If this is admitted, then it becomes necessary to consider their probable movements once escaped, by noting their possibilities and limitations, and deducing therefrom the best steps for intercepting them, which can most easily be done by considering the problem from their own standpoint.

To arrive at right conclusions as to the best methods of carrying out the defence of a given object, it is usually advisable to begin by ascer-

taining what is likely to be the exact nature of the attacks to which it will be exposed. This may appear too obvious to require statement, but, as a matter of fact, it seems to be sometimes lost sight of.

Commerce-destroying operations, as far as can be judged, may broadly be divided into two classes—those which would be carried out in narrow waters where our trade routes necessarily pass close to the enemy's coast line and seaports, such as the Channel, North Sea, Mediterranean, Baltic, etc., and those conducted on the open oceans at great distances from the destroyers' secure bases.

For the former, small craft and torpedo-boats would be the most suitable, as they can more easily run blockade undiscovered than larger ships, and their limited coal stowage prohibits their use in extended depredations. This work would probably be done entirely under cover of darkness (if it was found that the difficulty of identifying a ship's nationality at night was not too great an obstacle for its successful fulfilment), for which, of course, the winter months would offer the best chances, giving in the latitude of the Channel about fourteen hours in the twenty-four. To frustrate attacks of this nature, special watching and patrolling arrangements framed to suit the different localities would have to be made, and these will be considered in detail hereafter, as they will necessarily vary for different enemies and the particular lines of traffic to be defended accordingly.

For the second class, larger cruisers would be required in order to obtain the combined speed, sea-going qualities, and coal power necessary in a high degree, and they may be more generally dealt with on the whole. For all foreign countries, it may be said these latter operations are much restricted in their potential scope by the want of distant and secure coaling bases in sufficient number, and, indeed, few nations possess any at all worth considering. Ships so engaged would consequently be dependent on other sources for replenishing their bunkers than those available for our own, and, to provide for this, perhaps their most practicable arrangement would be to secretly charter neutral steamers in neutral ports, despatching them to meet their cruisers at pre-arranged places. As it would be advisable, however, for both colliers and raiders to avoid observation if possible, these rendezvous would have to be in remote and preferably uninhabited spots, where there was no telegraphic or regular mail connection with the rest of the world, and such are comparatively few, especially as they ought to be near some principal line of trade to save the time and coal spent in passing to and from it. The alternatives to this scheme would be coaling under way, but that is such a difficult and tedious operation as scarcely likely to be resorted to except in the last extremity, or coaling in unfrequented anchorages as above, but from a captured steamer. It is noteworthy, however, that the former might not be open to the same objections in the case of a ship fitted to burn liquid fuel. The latter, of course, leaves a good deal to chance.

These being the two general systems of conducting the attack on commerce which would fairly cover all operations with that object, it is proposed to examine in detail the best methods of safeguarding the same.

As such methods would have to vary in accordance with the different countries with whom we chanced to be in conflict, it will, perhaps, be well to begin by considering who may be the more important of our possible adversaries, and dealing with each of them separately as they come under notice. This, however, cannot be satisfactorily done in an indefinite manner, and consequently these countries will herein be named, and not referred to as "certain foreign Powers." If, therefore, by any chance this essay should ever meet the eyes of officers belonging to other friendly nations, we trust that it will give rise to no offence, for none is intended, and the whole scheme is, of course, merely offered as an arrangement to provide for possible contingencies. Exhaustive plans for the invasion of England and other hostile undertakings against us have frequently been published by various writers abroad without provoking protests on our part, and it is therefore to be hoped that this will be received in the same spirit should occasion ever arise, especially as they are all referred to, the actual precedence in treatment merely arising from their comparative maritime strength. As, however, it is sometimes impolitic and undesirable to openly discuss the details of tactical plans and actual fighting arrangements, as considered apart from the broad features of a general strategical idea, the detailed suggestions for putting into execution the different schemes advanced are herein given in the form of appendices, to be included or otherwise as the Council or referees may decide, should the question ever come up. They are part of this essay, but the general outline is complete without them, and they have been worked out more to examine the feasibility of the various plans and estimate the number of ships required than anything else.

The civilised nations of the world possessed of respectable Navies may roughly be divided into three groups for our purpose, which all other combinations will merely modify to a greater or less extent. Of these the first, and by far the most formidable, would be the alliance of France and Russia, which will herein be referred to as the "Dual Alliance." The second of these possible hostile combinations is the Triple Alliance of Germany, Austria, and Italy; while the third will be taken as any group of Transatlantic countries, of which one component is the United States. The settlement of disputes by arbitration may, or may not, be effected between the latter and ourselves, although to be hoped for; but it would in any case be well to be prepared for the alternative, and indeed the knowledge that we are prepared would greatly assist in bringing about the resort to arbitrament so much to be desired. Additions to or modifications of these combinations might, of course, take place as has been said, but would be unlikely to necessitate any substantial changes in the arrangements for protecting our commerce. Such, however, are not imminently probable (although overwhelming military pressure on land might give rise to them as in the case of Spain before Trafalgar), and as they might be suggested to an indefinite extent, their inclusion would extend the subject beyond the limits of an essay altogether. As an attribute attaching to every case, it seems probable from the study of history that any war conducted with

the avowed purpose of destroying peaceful trade would be animated by the extremely bitter feeling which always accompanies more or less irregular operations. A distinguished French flag officer, at one time Minister of Marine, has written as follows:—

"To-morrow war breaks out; a torpedo-boat has sighted one of these ocean steamers freighted with a cargo of greater value than that of the richest galleons of Spain. The torpedo-boat will follow at a distance, keeping out of sight, and when night comes on, will, unobserved, close with the steamer, and send to the bottom cargo, crew, and passengers, not only without remorse, but proud of the achievement. In every part of the ocean similar atrocities would be seen. Others may protest; for ourselves, we accept in these new methods of destruction the developments of that law of progress in which we have a firm faith, and the final result would be to put an end to war altogether." In this we quote from "Brassey's Naval Annual" for 1890; and although the opinion given is controverted in some quarters, it seems logical to admit the right of the torpedo-boat to use her weapon if the cruiser may use hers, the gun, when endeavouring to force an escaping ship to bring to, each looking to the weapon as the ultimate means of attaining her object, and, indeed, the weapon is for both the real *raison d'être* of the vessel.

Moreover, the enemy would most likely be rendered exasperated and vindictive by the defeat or inaction of their battle-fleets, which must be the preliminary to this kind of work, and therefore uninfluenced by humane considerations of saving life, etc., if they chanced to interfere directly with the accomplishment of their designs. That such a state of feeling usually breeds a spirit of full retaliation is only natural. It seems also not unlikely that when affairs had reached this stage the territorial waters of countries, too weak to assert their rights by force would be little respected by either party, and that an enemy under the influence of these sentiments would be ready to face considerable losses in the attempt to execute their projects, especially if the moving spirits were not the personal sufferers, for it is scarcely necessary to say that history is replete with cases in which the popular voice has forced the undertaking of operations which were contrary to the ideas of those upon whom devolved the duty of carrying them out.

Before proceeding into details there are two conclusions which apparently may be drawn from a perusal of the subject, each of which may be in a way indirectly some safeguard to us. In the first place, should such an unlikely thing as the ruin of British trade become an accomplished fact, the country or countries succeeding to the same would not be our adversaries in a war leading up to this result, who would without any doubt be themselves greatly exhausted on the seas, but some aspiring neutral profiting by the opportunity, which, if a Continental nation, would thenceforth be a most undesirable neighbour to all others from the wealth and consequent power derived thereby. Again, it seems a certainty that the attempt to conduct commerce-destroying operations of any magnitude will necessarily always be the

secondary phase of a war, only commencing when it has already been practically lost by one side or the other, from the fact that as long as the enemy's battle squadrons have sufficient strength and confidence to take the sea for the purpose of meeting our own, they *must* be accompanied by large fleets of cruisers to scout. As the manœuvres of 1896 seemed to prove that the twenty-five cruisers, exclusive of torpedo gun-boats altogether which took part in them, were not more than numerically sufficient for this work with the Channel and Reserve Squadrons alone, it is not unreasonable to expect that the enemy would require at least forty or fifty for the whole purpose. A glance at the useful tables compiled in "Brassey's Naval Annual" for 1896 shows, however, that a combination of the two most powerful Continental Navies could only produce forty-one altogether of such with a speed of not less than sixteen knots, exclusive of some small craft, and it would not therefore be until an enemy's battle-ships had given up disputing the command of the sea entirely that their cruisers would be freed from their primary duties to devote themselves to the attack of trade.

PART I.

War with the Dual Alliance.

The possibility of such a war is the most serious military question that England can be called upon to face, a fact due to the possession by these countries of the two finest Navies in the world next to our own, supported by great power, resources, and numerical strength of population, a strategically advantageous geographical situation, and fine harbours. In one respect they stand alone among foreign European nations of importance, being the possessors of distant and strong naval bases from which they could work as well as from those on the home coasts, of which besides there are so many on the French seaboard that the work of effectively watching and blockading them must necessarily be a very extensive operation. Whether our commerce survived the ordeal of such a war or not, it is certain that foreign shipping would receive a great stimulus by its effects, for the blockade of the enemy's harbours would drive Continental export and import to neutral jetties, and the number of enemies' ships locked up by blockade would cause a greater demand for neutral carrying capacity. It should be noted in this connection that the addition of another Power to the Alliance might not prove an unmixed evil, as it would free us of a possible rival for commercial supremacy at a critical period to our own; always provided, of course, we could still keep the upper hand at sea.

The French Navy possesses thirty cruisers with a radius of action extending to over 8,000 miles (as far as we can estimate from the *data* of their tonnage, horse-power, and coal stowage), sufficient to cross the Atlantic and return, three with a radius of over 3,000 miles, 12 small third-class cruisers, 15 torpedo gun-boats, and about 180 torpedo-boats of the larger sizes. The Russian Navy can produce nine of the first, eight of the fourth, and 81 of the last of these classes, giving a total for the

Alliance of 39, 3, 12, 23, and 261, all of which are vessels of not less than 15½ knots speed. In these statistics we quote from "Brassey's Naval Annual" for 1896.

(*a.*) *The Protection of Trade in the Narrow Waters affected by this War.*

The narrow waters requiring protection for their trade routes in the event of such a war would be the English Channel, and parts of the Mediterranean, Baltic, and North Seas. All these are bounded by the enemies' coasts, and the usual lines of traffic flanked at short distances by their naval bases. Unless we took steps to intercept them therefore, the hostile small craft and torpedo-boats could easily reach our shipping and return to port again within a few hours. The use of torpedoes has been already referred to, and in addition to the arguments then advanced may be added the suggestion that there would exist a peculiarly strong inducement to appropriate them for the kind of work now under consideration, in the fact that by showing no flash they are less likely to attract the attention of patrolling cruisers in the vicinity at night than a gun, while at any distance the sound of the explosion is much more difficult to locate.

It may be objected that supposing it were sometimes possible for torpedo-boats to run blockades successfully they would strike at the root of the existing state of affairs by attempts on our battle-ships, and if such were within easy reach of attack perhaps they would, but that is scarcely likely to be the case. If cruising, the battle-ships would probably be beyond the range of the limited powers of the boats; and if at anchor, presumably in some very carefully-guarded anchorage. The Japanese torpedo-boats took days to accomplish the destruction of the ships inside Wei-hai-wei, although operating with every advantage in the long winter nights from their own fleet immediately outside in full command of the sea, and while the defence was under gross mismanagement except for the efforts of a single Englishman. Moreover, they were greatly assisted by the successful operations of their troops on the mainland, and it is doubtful if any country in the world could do these things better on the whole. Nor is it possible that our fleets would be in a worse guarded condition than the Chinese, and therefore it seems reasonable to suppose that the enemies' boats would soon give up such attempts as a waste of men, material, and time.

If the hostile small craft were to be employed then as we have presumed, we should first gain a great step in forestalling them by making it impossible on their part to carry out the work except under cover of darkness, and this should not be difficult. As long as our cruisers and destroyers were maintaining their watch off the enemies' ports, and we had in addition a certain number patrolling the main line of traffic, it seems a practical certainty that any gun-boat or torpedo-boat would run a brief career if outside her base in the daytime. By securing this we should make it to all intents quite safe to navigate these narrow seas by day at any rate, and as we can now show, for ships which were

willing to lose a little time (extending over hours at most) there would not be much difficulty in arranging to pass the dangerous zone under this protection and anchoring in secure localities at night, if they could keep a speed of nine knots or thereabouts.

It will be well to deal with the extreme case in examining this which covers all others, and we will therefore take the month of December, when darkness lasts in the Channel for fourteen hours, as the period of war. Steamers then leaving the Thames would act as follows:—Anchoring in the Warp after leaving London Docks (preferably above the Nore), where they would be independent of tides, they could weigh at 3 a.m., and proceed. Those going down Channel would steam nine knots (faster steamers could weigh later if they liked instead), which would bring them to the open water near the Tongue lightship at about 5 o'clock, or two hours before daylight.

The Tongue, however, is forty miles from Calais, the nearest French base, and it would therefore be already high time for a hostile torpedo-boat "in the vicinity" to be moving home if she was to get there before dawn at 7. By sunrise these steamers would be half through the Downs, having ten hours more in which to push along before darkness again set in. That would take them up to the Owers, from which they would shape course for the Solent to anchor for the night, reaching the same at 6 or 7 o'clock, about two hours after sunset. During these two hours, however, they would be safe enough, as the nearest French base would be Cherbourg, sixty-five miles off, and nothing in the French Service could cover that distance in the time. Leaving the Solent next morning as before, they could work on to Plymouth for the second night, and leaving Plymouth again at daylight, be well beyond reach of molestation of this particular sort before evening, having lost no more than twenty hours or so in getting over the most risky part of their voyage, and worked quite independently of convoy or other restrictions beyond those indicated.

Ships bound northward would have much less to fear, as the harbours of the supposed enemy are too distant for carrying out this class of work very effectively. They would of course use the King's channel, and on emerging into open water be eighty miles from Calais, the nearest of such, consequently being safe still if arriving later or departing earlier by a couple of hours than the southward traffic, and unless trading to the Baltic-Swedish ports enjoy thenceforth comparative immunity. The protection of trade in that sea, however, would depend on the manœuvres of the main battle-fleets. If the Russian squadrons and cruisers had, preparatory to the war, assembled in French ports to effect an initial concentration of force, we should have nothing much to fear for any ships protecting the Baltic trade. If, on the other hand, they were still at Cronstadt on the outbreak of hostilities, it is quite possible that the admiral commanding the fleet allotted to watch them might decide that his duty could best be carried out by cruising in the Belts for many reasons, in which case our Baltic trade would have to be left to take care of itself, as it would be most inadvisable to risk cruisers by sending them

within reach of the enemy's main force and beyond the support of our own. This branch of our trade is not, however, one of very great importance, and should not, in our opinion, receive attention until the efficient protection of all the others has been attained. Moreover, during the summer months there is a total absence of the darkness necessary to cloak the approach of torpedo-boats, and in winter ice puts a stop to all sea work, including trade itself.

We should derive benefit from both these facts, as in the latter case our cruisers could be withdrawn and utilised in the Channel or elsewhere at the very time when the long duration of the night would make them most required.

To return again to the ships that have passed down channel. Those bound westward are clear of further danger of this kind, but the eastward traffic is not yet so. It is scarcely necessary to point out that the main factor of safety would lie in keeping as far from the enemies' coasts as was compatible with the demands of time in making a passage. In the Channel a limit is put to this distance by our own shores, but when once fairly on the Atlantic that restriction disappears, and it would simply rest with the master of a steamer to use his judgment in deciding how far greater safety compensated for a delayed arrival. It would be well that they should clearly understand, however, what the risks actually were, and especially the danger of arriving within a hundred miles of Brest between 10 p.m. and 2 a.m. in the winter months, which would place them within reach of fast torpedo craft working between sunset and sunrise. In standing on thence to the southward they would have little to apprehend from small craft, unless one succeeded in getting along the Spanish coast unobserved, and coaled in some bay near Cape Finisterre by night from a tug acting in conjunction; an exigency, however, to be provided for in the general scheme of blockade hereafter. On entering the Mediterranean the same principle of keeping a safe distance from the hostile shore would hold good, and interfere very little with the traffic. Once past Bizerta, further anxiety on this particular head would be at an end, unless a ship was bound east of Saigon. Ships returning home would be guided by the same arrangements in converse order to make safe passages, the whole thing being merely a question of shaping courses and timing arrivals and departures to suit them.

It is possible, however, that some owners might from commercial enterprise or other motives decide that their ships should not be hampered by even the small loss of time suggested above, and demand protection for them by night, for which provision should therefore be made. One circumstance at the outset would certainly afford a considerable safeguard. It will be difficult in most cases for an attacking boat to distinguish belligerents from neutrals, but most especially so when dark, as the merchant steamers of the world in general are very similar in type, many of them having been launched from English yards. It is conceivable that this might in itself prove such an obstacle to night operations as to stultify them altogether, and undoubtedly it must greatly hamper them, for if the enemy began using search-lights they would soon reveal

their whereabouts to the nearest defenders, although perhaps it would scarcely do to trust to this entirely.

To effectively protect the shipping on all such parts of our main trade routes as are in close proximity to the enemies' fortified ports, therefore, a vigilant blockade of the ports by day and night would probably be necessary, supported by an arrangement of patrols actually on these parts of the line of traffic, and for the purpose of carrying out such operations detailed schemes are given in the appendices.

We cannot foretell with any certainty what the disposition of the enemies' forces might be on the outbreak of war, which complicates the question of providing for the safety of commerce somewhat in its details, but not in its general policy. As far as can be judged however, the bulk of their heavy fleets would not be in Channel or Atlantic ports (or at least we might arrive at that conclusion from their usual movements and positions), and if so, presumably a proportion, large or small, of their torpedo-boats and torpedo gun-boats would be with them. Presumably also our own fleets would be more or less attendant with their necessary quota of ships of those classes, which could not very well be spared altogether for these blockades in consequence. The scheme given in the appendix has therefore been drawn up on the supposition that it is to be carried out independently of the main manœuvres so as not to hamper our battle-ships in any way. If the enemies' main forces *had* retreated on these ports, on the other hand, the only result to the gun-boats and destroyers on blockading duties would be to have their work facilitated by the assistance and reinforcement of those on fleet duties.

The question of the temporary fate of the Suez Canal during war has been greatly discussed from various standpoints. This is the narrowest of all narrow waters, and the opinion is apparently extensively held that its obstruction will certainly be effected sooner or later by our enemies after the commencement of hostilities.

We cannot see, however, why this should be, if the simplest preventative steps are immediately taken. The canal is easily seized from end to end by the Power in command of the sea, as we have already practically demonstrated by doing it; and if we repeated this manœuvre, making ourselves responsible to the world for its freedom for traffic by inspecting and conducting every vessel using it, all neutral countries would be placed under an obligation to us, whose shipping would suffer by its closure just as much, or perhaps proportionately even more than our own. The captain of a steamer found with dangerous explosives in her hold would promptly swing from the end of a spar on board the guard-ship, and the entire staff of officers of any ship actually sunk in the fair way would suffer a like fate, whatever their nationality, unless able to give convincing proofs of innocence.

This would be a perfectly justifiable belligerent proceeding with many analogous precedents. Not only all neutrals, but especially all shareholders would benefit by the regular payment of dues under our guarantee, which of course they would lose altogether by any stoppage of traffic. Unless these arguments are entirely fallacious therefore, this step should

certainly be taken, and could easily be effected by stationing a coast-defence ship at either end and establishing a staff of our own pilots and inspectors placed with a small military guard on board each ship *en route*. The coast-defence ships could close the canal to any hostile vessel, a matter of great strategic importance, and for this purpose no craft could be better suited than the "Magdala" and "Abyssinia," which could best defend India and the trade of the Indian Seas by lying between them and the enemy's point of approach—a true principle of all strategy.

If, on the other hand, the Canal did get blocked in spite of all precautions, the state of affairs would have for us its considerable compensating advantages. The alternative Eastern route lies entirely in our hands, and neutral shipping, if found to be supplanting us, could be put under considerable, and perhaps prohibitive, difficulties in the matter of coaling, etc., without any actual infringement of international usages. In any case, however, the idea of abandoning the Mediterranean so often advanced appears to us to be utterly indefensible for a variety of reasons beyond this immediate subject.

The arrangements suggested for the protection of our trade in these narrow waters may therefore be summarised as follows:—Firstly, a close blockade of the necessary ports supported by a patrol of the line of traffic; secondly, the provision of adequate protection for certain night anchorages; thirdly, the seizure of the Suez Canal.

(*b.*) *Protection of Commerce on Ocean Highways.*

For the attack on commerce on the great ocean lines of traffic a totally different class of vessel must be used to those just under consideration in section (*a*), as they will necessarily work under very dissimilar conditions.

The operations of one of the latter could not extend over a few hours at a time, and to be successful must depend not only on escaping the look-out of the blockading and protecting ships, but on the close proximity of her objective. A ship of the former class, on the other hand, once started might if uninterrupted carry on her depredations for weeks, if not months, but would have to cover great distances in doing so. She would be cut off entirely from support, and although presumably her captain should be provided with sailing orders on a general outline, it would be necessary to leave him a wide exercise of discretion, as communication with her own authorities would be very rare, if not impracticable. The ship herself must possess the qualifications of speed, seaworthiness, and coal power in a high degree as her first requisites. Armament becomes a factor of comparatively secondary importance, as she could not in any case hope to hold her own for long against the numbers that would sooner or later appear on the scene if she was once tracked down, and extra weight of armament means less weight of coal. Evasion ought, therefore, to be the basis of her proceedings, and unless successful in this, her work would almost assuredly remain unaccomplished on any great scale. In dealing with this particular branch of the

subject, then, it becomes noteworthy that there are vessels both built and building in the French and Russian Services which exactly satisfy these conditions, being avowedly designed as commerce-destroyers and nothing else; while as far as recent debates in the French Chamber may be taken as a guide, there is a tendency abroad to further expenditure on these lines. It has been already observed that the Dual Alliance possesses in Cochin China and Siberia far-distant bases with at least two harbours capable of resisting attack except in very great force, which might prove exceedingly useful as the ultimate point of her cruise to such a ship leaving European waters for raiding on the high seas. No other countries possess this advantage, and theirs, if so employed, would have to endeavour eventually to return to the neighbourhood from whence they had started, which would probably simplify the question of pursuit considerably. The cruisers of this Alliance, on the other hand, would have an alternative, and their movements once fairly started be more obscure in consequence.

Putting the question of convoy aside, there are two methods of providing against their operations: first, by patrolling all the principal lines of traffic by cruisers of sufficient power to deal with any one of them or even with a small squadron; and, secondly, by making the best feasible arrangements for ensuring a certain number of our own ships being closely attendant on each individual one of theirs wherever she might be, to attack her the instant an opportunity occurred. The former is based on the idea of what Admiral Colomb in his lecture of June, 1896, called the "instinctive" school of defence, and arises from the supposed possibility of a hostile cruiser or squadron turning up at any given point on any trade route, and meeting a more powerful British one somewhere there or thereabouts. Theoretically, this might provide a perfect protection if money were no object whatever, but practically it seems to us beyond attainment, for even on the most economically executed plan it would require the services of at least 300 or more first-class cruisers, and these would be too much scattered over the world to be available for any other duties if suddenly required. Moreover, *all* the ships would have to be equal in power to the best of the enemies', as with such vessels as the "Rurik" or "D'Entrecasteaux" running along a trade route it would be of very little use to have second-class cruisers stationed at isolated intervals for its defence. As still further objections to this plan of defence would be the difficulty of keeping the cruisers supplied with the constant information which is of such vital importance in war, and, though perhaps this may only be a comparatively small matter, the great expenses to be incurred for coal, etc.

The second of these systems is founded on what we are constantly taught is a true principle of war—namely, the application in whatever may be the best manner under the circumstances of superior forces numerically and individually at whatever points the enemies actually are, not where they may be; and although there are considerable difficulties and obstacles in the way of so defending commerce, it is nevertheless the general idea on which we shall herein proceed.

Working on this main idea then, it would be proposed to strain every effort to keep constantly in touch as near as might be with each one of the enemies' ships. The perfection of the arrangement would be absolute blockade, or any other similar plan by which they had to pass observed within range of our guns before getting away to sea. In many cases, however, perfect blockade is unattainable by any known means, as already noted; so we should simply have to be prepared to make it as effective as was humanly possible, relying for the rest on our cruisers held ready for the purpose being able to follow and eventually run down an escaped ship, on receiving knowledge that she was at large, being guided in the chase either by direct information from passing ships, or the tell-tale non-arrival of others known to be due on certain routes, but perhaps principally by carefully considering her probable movements beforehand, as previously suggested. That they would soon overhaul her there can be very little doubt, as even if she was steaming fast the delay caused by the necessary stoppages while actually engaged in the work of destroying the ships she fell in with would be considerable. If, in addition to this, our merchant steamers were given to thoroughly understand that when chased on the open oceans their best chance of escape would lie, as a general rule, in retreating if possible in the direction of the enemy's first approach, the enemy would be still further delayed in her general progress, and might perhaps at times be led back straight to within sight of pursuing cruisers.

We are disposed to think, however, that there are two exceptions, and most important ones, to the general rule that operations of a closing or blockading nature cannot be relied on for anything like certain results. It seems to us that without a very great display of force the Mediterranean and Baltic Seas could be so absolutely closed that the undetected egress or ingress of any ship would be almost impossible. By securing this we should reduce the number of ports available to the enemies as starting-points for the attack on ocean traffic to those on the northern and western coasts of France and those in the Far East of Asia, in addition to shutting off in all probability a proportion of their ships from the attack on trade on the open oceans altogether, for the following reasons.

It has already been noted that if an enemy's battle-fleets are to be provided with an accompaniment of cruisers in anything like the same proportion that we find necessary for our own, there would be none available for other work while squadron fighting and manœuvring continued. If the Mediterranean was the arena of the general actions, most of them would therefore be in its waters, and by sealing the exits at Gibraltar and Port Said we should reduce the area available for any commerce-destroying work they might attempt after the decisive defeat of the fleets to very narrow limits for this majority of their suitable vessels.

We think it goes without saying that we should herein obtain a great advantage at the outset, precisely proportionate in extent to the number of cruisers so locked up, and only requiring some additional concentration

of our own from other places. In the extreme case (of course improbable) the whole of them would be so situated. The other extreme would be their total absence from these ports, followed by a corresponding withdrawal of the whole of ours except the force closing the entrances—a condition of affairs even more unlikely when the enemies are France and Russia. Details of a plan for closing the Mediterranean are therefore included in the appendix. As regards the Baltic, even should there be none of the enemies' cruisers within its limits, a closure of the entrance would still seem advisable to prevent them retreating on its ports, and could easily be effected. If any of them did happen to be inside, so much the better for us, as a still further proportion of the enemies' available forces would thereby be debarred from getting out at our ocean traffic, and there would be fewer left to be watched on the French coast. Most of our traffic in Baltic waters runs to Russian ports, and would therefore in any case lapse for the time, while the loss of the rest would not be very serious, and should, we think, only be guarded against if sufficient force could be spared when the thorough safety of the great trade routes had been assured.

To effect the closure of these two seas and by such means restrict the enemies to the use of their Atlantic, Channel, and Oriental ports would therefore be the first step in this general plan of campaign, and the detailed suggestions for putting these operations into execution are given consequently in the appendices.

Having done this, it next becomes necessary to consider the best scheme of operations for protecting the commerce on all high seas outside, and to form an estimate of the number of ships required and their best disposition. If it is supposed as a basis for this estimate that two-thirds of the enemies' cruisers with a radius of action extending to over 8,000 miles are outside also, the supposition ought apparently, for the reasons before given, to cover an ample margin, but if not, the increase in their numbers would merely have to be met by a re-adjustment of the opposing forces. Taking the total of the allied enemies' cruisers with at least 8,000 miles coal power as amounting at the very most to forty-one built and building, there would, therefore, be about twenty-seven or eight so situated, of which it seems probable that six or seven would be in Far Eastern waters, from their usual customs in that respect, and the remaining score or so in European. To watch and blockade these ships the necessary squadrons would have to be collected at the best available points, which would be the second step in the general scheme, and for which therefore details are considered in an appendix.

In spite of all endeavours and precautions, however, which cannot be made absolutely certain in result, these hostile cruisers might effect an escape at times, and provision should therefore be made to thwart their proceedings, even when once fairly beyond the grasp of blockade, as the third and final step.

The difficulties in the way of a commerce-destroyer on the open oceans have been suggested. Her first absolute necessity is obviously coal, a necessity which places such a restriction on her movements as to

give an extremely useful basis in forming an estimate of them at the start. It is scarcely probable that she would allow her stock to be depleted to less than half her total stowage if she could possibly help it, as she must always be ready to run, and full speed of course entails a consumption of fuel out of all proportion to the increased mileage as compared with economical. Neither does it seem to us likely that after surmounting the difficulties and dangers of blockade running she would limit her further operations to the time and distance for which her coal sufficed without replenishment if a further supply was by any means obtainable. Furthermore, she must escape observation as long as possible, and therefore avoid not only the usual coaling centres of the world, but all civilised coasts.

Bearing these facts in mind therefore, the conclusion may we think be drawn, that as only four cruisers in the Alliance possess a radius of action extending to 15,000 miles, any successful blockade runner would coal at some spot within 7,000 miles of her starting-point, while at least three-quarters of them would do so at about 4,000 (roughly the distance to the West Indies), and the spot selected would not be in the general telegraph system. If seen by blockaders or anyone else, the four cruisers mentioned would be easily identified.

As a second foundation for the forecast of the probable movements of such a ship, it may we think be assumed that being anxious to effect the greatest amount of damage in the time at her disposal her track would lie on some main line of ocean traffic. If otherwise the destruction accomplished would be on too insignificant a scale to make the attempt worth the risk at all. Escaping from a French Atlantic port she would have four such principal trade routes for her selection at once: first, the line from Europe to the United States and Canada; secondly, that to the West Indies; thirdly, that to the south-east coast of America and on; and lastly, that round the Cape of Good Hope.

If she chose either of the first two, she would almost certainly endeavour to coal at Martinique or one of the most remote of the West Indian keys, which provide the only available secluded spots; if she chose the third at a Mid-Atlantic Island, of which St. Paul's is the only practicable one anywhere near the passing trade; if the fourth, at some out-of-the-way locality on the West African coast. On receipt of information by wire from the blockading scouts that a ship (identified as of a certain class or otherwise) had broken through, the following steps would therefore by our scheme be taken at once:—Firstly, telegraphic orders sent to the sloops or gun-boats actually on these several stations to carefully search and watch the spots where she might be expected to meet her collier, any neutral steamer whose movements were suspicious, being strictly attended to; secondly, four cruisers of *corresponding power* lying ready at Plymouth immediately started (at a speed likely to be greater than the approximately economical of the ship pursued) on the four main routes, getting any news possible from passing vessels. And here it may be observed that in such a scheme as this semaphore signalling, if introduced into the mercantile marine, might prove of

immense assistance. These four chasers would coal at or near New York, Barbados, Pernambuco, and Sierra Leone respectively on arrival, when they ought under almost any circumstances to hear something further regarding the whereabouts of the object of pursuit, even if none of them had come up with her. Their subsequent movements would depend on this information, but in most cases it should be possible to recall at least two of them to England again. If it were ascertained that the raider was operating on North Atlantic lines the first two could maintain the chase, while if she had taken a southerly course with the intention of doubling either Cape and continuing her work towards Vladivostok or Saigon the second pair would follow up, and similar precautions be taken to look out for her colliers at likely places; of which Prince Edward Island, the Straits of Magellan, the Galapagos Group, and certain anchorages in the remoter parts of the Malay Archipelago seem on examining the chart to be the most suitable as regards intervals of distances and proximity to traffic, while beyond telegraphic reach. It is not likely that ships with coal power for less than 10,000 miles would attempt the latter cruises, and consequently the two ships despatched to chase on the southerly lines ought by such an arrangement preferably to be selected for high qualities in this respect also, but not necessarily, having the advantage of a much larger selection of coaling stations.

It would be an interesting question as to whether the four chasers would not find it best to commence their pursuit by working on "curves of search." For a successful accomplishment of this operation, it is, of course, necessary that the enemy should be steering a straight course, and that the chasers should know fairly correctly her speed and hour of departure. If her escape was known at all to the blockading force the hour could be exactly fixed and reported, while in most cases it would probably be correct to assume that she was travelling for the reasons before given at approximately her most economical speed. In addition to this, as she would almost certainly be anxious to push clear of a dangerous locality and get to work, it might very often prove also correct to surmise that her course would be a straight one, at any rate to start with. Given these inferences therefore, the general conditions seem to point to the conclusion that these "curves of search" might not unfrequently attain their object, especially if the four chasers worked on different curves, and even when unsuccessful the time lost would be too little to be a serious drawback. In such cases the pursuers would proceed right on along their allotted trade routes.

As regards the possibility of one of the enemies' ships so employed successfuly beating off a pursuer when brought to action, it should be observed that even if she did her predicament would be very critical, as she could find no means of obtaining a fresh supply of ammunition, and would be therefore practically at the mercy of any cruiser subsequently encountered. Coal might be obtained from captured steamers on an emergency, but not powder and projectiles. With the quick-firing ordnance of the present day, magazines are very soon emptied, and moreover it is notoriously the case that most foreign ships carry a much

smaller allowance per gun than our own. Actual resistance would therefore probably be only resorted to in the last extremity, and this apart from the fact that the serious damage which might be received in even a successful action could not possibly be made good. It may be thought that the steamers employed by them to provide coal might also carry ammunition, but if we blockaded the enemies' coast these would have to be chartered and loaded at neutral ports, and the shipment of ammunition in any quantity at such places could not escape observation if our consuls and agents were vigilant, while if detected would be quite enough to mark the receiving ship for special notice.

If the whole 20 or so of the enemies' large cruisers requiring to be watched from Plymouth had each four of our own detailed as above to counteract her proceedings, a force of 80 similar ships would theoretically be necessary here. This is however we think obviously an extreme estimate in practice, for it appears quite reasonably certain that a proportion of those which attempted such operations would be sunk or captured while endeavouring to break the blockade; and of the remainder which escaped this fate, a further proportion at least if not all, be sooner or later run down by the pursuers and brought to action—an event which for the reasons just given must practically put an end to their proceedings, for the time at any rate, however the actual fight resulted. If a pursuer was sunk she would, of course, be a loss of more or less importance, a necessary risk of war; but if only temporarily beaten off, she would make for our nearest port for repairs and ammunition; and if victorious and able to do so, at once return home in case of further requirements. Should the enemy issue in pairs or squadrons, which, of course, is possible, we should in most cases have to wait and ascertain whether they were cruising in company or separating. If the former their course would probably be very soon known, for a squadron, even if greatly extended, is a much more conspicuous object than a single vessel, and must attract the attention of passing ships up to considerable distances. To employ a squadron however in destroying commerce would be a waste of power, as a single cruiser following the same track ought to be able to accomplish very nearly as much damage; and, if a squadron's component ships were despatched on separate routes, its total work would consequently be so many times multiplied. Moreover, they would be more difficult to keep supplied with coal than single ships, for obvious reasons. Supposing in spite of these drawbacks, however, a squadron did keep together, we should simply have to despatch a stronger one after them when their direction was known. If they separated, on the other hand, when once outside the blockade, we should derive an advantage in that the pursuing ships on the various routes would be following up a greater certainty than if only one emerged at a time, and instead of having four scattered in pursuit with only one at first on a right track, all four probably so.

For the six small cruisers to be here dealt with a force of similar ships of our own would be held in readiness to act on the same general plan as the larger ones, but their capabilities for harassing commerce are much more limited, as none of them have coal power sufficient to cross

the Atlantic without obtaining a further supply *en route*, or to remain at sea for more than short periods at a time.

If 40 of our larger sea-going cruisers were kept at Plymouth prepared to start in pursuit of the 20 of the enemies' as suggested, whenever necessary, the proportion of two to one so provided ought, we think for the reasons advanced, to be sufficient. Many of these, if not all, could be withdrawn from the scouting work of the Channel or reserve battle-fleets, scouting being for the time over or carried out by the blockading destroyers, and could be again available for such work if required being near at hand. It is thought by some that hostile commerce-destroyers would lie off the approaches to our chief mercantile centres, but if that were so the knowledge of their presence must come very quickly and one or more of the ships so held in readiness could be at once despatched to the spot.

There remains only to make provision for dealing with those supposed as before stated to be in the Far East. The necessary steps to be taken here must differ widely with the seasons, for in winter Vladivostok is not available for the enemies' use, and their forces must, therefore concentrate on Saigon. This of course would facilitate to some extent the watch on their movements, but the blockading force would work under the disadvantages caused by the north-east monsoon.

Proposed details for such blockading operations are included in the appendix.

In the event of any enemy successfully escaping from Saigon, she must be followed up as in the cases already considered. Three routes would be open to her choice:—First, that to Hong-Kong and the northward, to attack Australian traffic, etc.; secondly, that through the Straits of Singapore towards India; and thirdly, that through the Straits of Sunda towards the Cape of Good Hope. The latter is, however, chiefly used by the sailing trade, and it seems to us certainly open to doubt whether this primitive though undeniably cheap method of locomotion will be continued in war-time. Fortunately the proportion of sailing-vessels in our mercantile marine is steadily decreasing in favour of steamers.

Three cruisers would, therefore, be required to temporarily leave the blockade and start in chase, one on each route; but as the knowledge of the direction taken by the enemy must come even more quickly in these localities than in the Atlantic, two could probably very soon return. To arrange for this it would we think be advisable for the two on southerly courses to call at Singapore and Anjer, either to send or receive information by wire. In the event of either ascertaining she was on the right track she would telegraph to the other and to Hong-Kong, from which place a gun-boat or steamer would be despatched to meet the northward bound cruiser at some pre-arranged rendezvous off the Paracels or elsewhere and send her back. On the other hand, should nothing have been seen or heard of the enemy on the southward and westward routes, the ships pursuing on these would be tolerably safe in concluding she had gone north. To make this further certain, however it might be advisable to arrange that

the non-arrival on her proper date of any merchant-ship expected at one of these places should always be wired to the others at once.

It should be noted that the 10th parallel intersects the area of blockading operations at Saigon. This is considered the southern limit of typhoon latitudes; but as we believe rare cases of typhoons have occurred even to the southward of this a careful watch on the barometer and weather indications would be imposed on the ships.

In the summer season the allied enemies might divide their forces between this port and Vladivostok, necessitating thereby a proportionate division of our own.

A cruiser escaping from Vladivostok would have to take a southerly route if she wished to effect any damage worth considering. Trans-Pacific trade under the British flag is insignificant in amount, and north of this port there is practically none. She would, therefore, be followed to the southward, a steamer from Simonoski intercepting the chasers off Tsu Sima or wherever best with any information subsequently obtained. The absence of a ship from inside Vladivostok could, we think, be discovered by direct daily reconnaissance, the harbour being formed by the indentation of the coast, and not by a river as at Saigon. This ought to make it nearly impossible for an escaper to get more than a few hours' start even if unobserved when getting out. "Curves of search" would perhaps be very useful for intercepting a ship breaking the blockade of either Saigon or Vladivostok.

Finally it may be said that there is such a vast amount of various traffic in Chinese waters, nearly all confined to one or two routes hugging the coasts, that a commerce-destroyer could not possibly conceal her movements for even a few hours—a circumstance which we think ought greatly to facilitate the work of the pursuing ships, especially as the steamers under the Chinese and Japanese flags are mainly officered by British subjects, who would, we may be sure, be ready and anxious to give information.

To summarise these ideas for the protection of commerce on the open ocean therefore, we would suggest by the above scheme, firstly, the closure of the Mediterranean and Baltic to the enemies' ships; secondly, the most efficacious blockade of their Channel, Atlantic, and Asiatic ports possible; thirdly, the maintenance of a sufficient fleet of cruisers at Plymouth and certain points in the Far East ready to start immediately in the requisite numbers in pursuit of a successful blockade running cruiser; and fourthly, the provision of an adequate force on the Mediterranean line of traffic itself; for all of which proposals the details are given in the appendix.

This therefore ends the general scheme, such as it is, offered herein, as a means of protecting our trade in the event of war with the two most powerful of our potential maritime adversaries. That there are many imperfections in it we do not for a moment doubt, but with due deference to the opinions of others we venture to think that any really feasible plan based on these general principles would be more efficacious and satisfactory than a system of patrols and convoys, however well

managed. The force required for the purpose, exclusive of the battle squadrons which must supply the foundations of power, amounts in all to about a hundred and fifteen or twenty cruisers of various sizes but not less than 16 knots speed, forty-five to fifty torpedo gun-boats, eighty-five to ninety destroyers, and ninety torpedo-boats. Nearly all these would be to hand in case of sudden requirement to revert to scouting work for the fleets. Perhaps the duties of some of the torpedo gun-boats might be carried out by older and slower ships, and in some parts destroyers and torpedo-boats would be interchangeable.

PARTS II. AND III.

War with the Triple Alliance or American States.

It was intended at the commencement of this essay to enter fully into the details of the subject in the event of such wars, if possible; but the limits of space allowed by the rules of competition have, with the appendices already been nearly filled, and these remarks must therefore be condensed to the utmost. It may perhaps be almost enough to say that the fleet requisite to protect our trade against the attack of the Dual Alliance would amply suffice for either of the others if properly disposed. In the case of the Triple Alliance, the ships previously allotted to deal with the cruisers in French-Atlantic and Channel ports could be utilised to strengthen the Mediterranean and Baltic forces to a condition of overwhelming preponderance, and those in China withdrawn very nearly altogether. Moreover, in such a war we should be freed of a dangerous commercial rival in Germany, whose fleet, good in quality, is known by every naval officer to be numerically quite inadequate for protecting her great trade.

In the case of a hostile Transatlantic combination of the nature supposed our vast traffic with the United States would lapse of course for the time, and be a most severe loss to the enemy as well as ourselves; but the Allies' geographical situation would render attacks on our commerce in other quarters of the globe even more difficult than for a European adversary, and our possessions in the West Indies give great assistance to us in affording effective bases for counter-attack and offensive defence.

Conclusion.

There yet remain two brief remarks of a general nature we would make on the subject. The use of disguises has not been referred to, but it seems to us probable that if every steamer carried a foreign ensign and pot of paint to falsify her name and port of registry if necessary, an enemy's commerce-destroyers would be greatly puzzled and delayed in their work, and sooner or later get into trouble by stopping and boarding neutrals on the high seas.

Secondly, attacks on private property, if persisted in, might provoke reprisals in kind; and should the enemy continue to sink and burn our

peaceful traders, we should be perfectly justified in retaliating on their defenceless towns along the seaboard, whatever the strictly international customs on this point may be.

This closes our treatment of the subject.

The writer is deeply indebted to Admiral Colomb and Captain Mahan for the instruction and information acquired by the perusal of their works, on which the main ideas given above have been founded; also to the editor and contributors of "Brassey's Naval Annual" for the constant assistance derived from reference to the statistics of foreign Navies compiled in so convenient a form in that publication.

APPENDIX.

Details of Proposed Blockades and Patrols.

A.— The Defence of Commerce in Narrow Waters from the Attack of Torpedo-boats and small craft.

It has been noted that the French Navy possesses 15 torpedo gun-boats of under 1,000 tons with a speed of 17 to 20 knots, and about 180 torpedo-boats; the Russian 8 and 80 of these respectively. Assuming as the best rough estimate that half the French torpedo-boats, and half the combined total of French and Russian gun-boats are in Channel ports, we should then have about 12 and 90 of these classes respectively to deal with there. If the Russian torpedo-boats had not assembled in these ports before the war (an unlikely circumstance) they would have little chance of doing so after, and we therefore propose to assume their absence in their own.

The enemy would derive advantage by distributing this fleet amongst as many different harbours as possible, for the probable key of their schemes would be to avoid contact with opponents, and by spreading themselves about they would render themselves more difficult to watch. Further, if they made their arrangements suitable to their materials, they would work the torpedo-boats from the refuges nearest the line of traffic as they have the shortest radius of action, and indeed, Dunkerque, Boulogne, Fécamp, and Dieppe, are scarcely capable of use by anything much larger. From this it is possible to obtain a rough estimate of the force likely to be required as a check at each of these points, taking into consideration the capabilities of our various classes of ships, and utilising them accordingly.

Upon these assumptions, then, we would suggest the following distribution of the 90 or 80 hostile torpedo-boats in the Channel as possible, or perhaps not even unlikely:—At Dunkerque 10, at Calais 20, and at Cherbourg and Brest 30 each. The first of these is not strongly fortified, but the approaches are long, narrow, and intricate, lending themselves easily to mine defence. To risk a large ship forcing her way to a position sufficiently close for firing on boats inside would therefore be unadvisable, and as a few field guns could keep off destroyers, this place, being fairly safe, might probably be used. Calais is well fortified, and

ideally situated for harassing shipping. Cherbourg and Brest are also powerfully defended, being the principal harbour fortresses in Northern France. The other Channel seaports near the trade route, such as Dieppe, Boulogne and Fécamp, are not strong enough to resist ships with an armament capable of silencing field artillery, and boats using them would do so at the risk of being destroyed at their moorings by such a vessel, the approaches being open and the water ample for close attack. There are several estuaries suitable for small craft west of Cherbourg, but passing ships could keep 80 miles at least clear of them, and their situation is therefore too unfavourable to make their general use likely. The same applies to Havre. These anchorages would consequently require frequent reconnoitring rather than regular blockade. A boat leaving Calais, on the other hand, would be on the line of traffic within an hour at its most congested point.

The 12 gun-boats might perhaps be located somewhat as follows:—5 at Brest, 5 at Cherbourg, and on the same principle of dispersion as before, a pair at Calais. Any modification of these dispositions, however, would simply be met by a corresponding redistribution of the force detailed for counter-action.

If the enemies' main fleets are supposed to have been driven back to their own practically impregnable anchorages, it seems reasonable to presume that we should have a certain number at any rate of first-class torpedo-boats available to blockade their corresponding class, which with the alternative armament on board, would join the destroyers in their work. As previously remarked, it would apparently be usually a mere waste of men and boats to occupy them in attempts to force their way into such places as Toulon if the lessons of Wei-hai-wei count for anything. For blockading purposes, on the other hand, they would be invaluable, whether against large or small ships, and their services will consequently be counted on in these schemes.

Having obtained, therefore, the necessary information of the approximate numbers and stations of the enemy by spies, prisoners, direct reconnaissance, or otherwise, and supposing it to be roughly as suggested above, the following arrangements are proposed as a means of dealing with them.

To blockade -	Dunkerque - - -	3	destroyers, 7 torpedo-boats.
,,	Calais - - - -	3	torpedo gun-boats, 6 destroyers, 14 torpedo-boats.
,,	Havre - - - -	1	torpedo gun-boat, 1 destroyer.
,,	Cherbourg - - -	7	torpedo gun-boats, 15 destroyers, 20 torpedo-boats.
,,	Brest - - -	7	torpedo gun-boats, 15 destroyers, 20 torpedo-boats.

To patrol - -	Tréguier and coast to eastward as far as Cherbourg - -	5 destroyers.
,,	Morlaix and coast from Tréguier to Ushant - - -	5 destroyers.

Total:—18 torpedo gun-boats, 50 destroyers, 61 torpedo-boats.

This gives an estimate of 129 altogether to blockade and watch 102, a proportionate superiority rather below that of five to three which some of the highest authorities consider necessary to attain such a purpose, but the fifty destroyers are equal to more than the same number of torpedo-boats, and the estimate is exclusive of larger cruisers which might, as will be seen hereafter, be in support. It may be added that the numbers given are considered the minimum requisite for the purpose.

Of these flotillas the first two could work from Dover. The torpedo-boats could get well in shore, having the advantage in draught, and their primary duty would consist in discovering an escaping boat, leaving the destroyer to chase her on receiving intimation by rocket or gun signal. The latter would have to arrange a roster for this, so that only one should follow up at a time. A rocket in ordinarily clear weather would be visible to the coastguard at Dover, who could telegraph to Beachy Head, and St. Catherine's, where repetitions of the signal would warn the shipping and patrollers down channel to be on the look-out to the eastward. The coastguard at the North Foreland would pass the signal up the east coast by the Kentish Knock, and other lightships and lighthouses, of which there is a complete chain to the Leman and Owers.

To exclude the occasional use by the enemy of the unfortified ports between Calais and Havre, such as Dieppe, etc., a heavily-armoured cruiser, or better still, an old battle-ship of the broadside type (which, if armed with breechloaders, could afford to disregard temporary light batteries) would steam daily along the coast between these places, attended by a destroyer lent in turn from the Calais or Cherbourg blockade, and retire across the water at night. If boats were discovered inside, they would, of course, be fired on, and, if attempting escape, the destroyer would give chase, while to prevent the enemy laying mines in the offing she would remain cruising up and down for the night when the battle-ship had retreated.

If Havre is too strongly defended to be similarly dealt with, a torpedo gun-boat and a destroyer would have to lie off the port ready to meet any stray hostile craft that might try to enter, having found that for some reason she could not get into one of the other bases. It is fortunately an easy place to watch, and these two could anchor in the day-time with a comfortable depth of water beyond the range of artillery, and receive coal and supplies by a tug sent across from Portsmouth.

The next port westward is Cherbourg, a powerful though artificial naval base, situated in closer proximity to the traffic than any other except Calais, and having besides two exits to be watched. Taking all this into consideration, we have suggested that the enemy might assemble

not less than five or six torpedo gun-boats and thirty torpedo-boats here. Here also, however, we might perhaps reasonably expect to find some of their larger ships, whose movements would require attention just as much, if not more, than the small craft. A comparatively numerous force must therefore be apportioned at this point, amounting, in our estimation, to not less than seven torpedo gun-boats, fifteen destroyers, and twenty torpedo-boats, exclusive of supporting cruisers at some distance. This force would rest on Alderney as a base, which is fortunately within an hour's run, and allowing for the absence of about a third of their total number to coal in the day-time, there would still be sufficient left to deal with the enemies' gun-boats and torpedo-boats, even if they came out in force.

To the westward of Cherbourg the French coast-line turns sharply to the south and recedes so far from the line of traffic as to make it unlikely that the harbours suitable for small ships, of which there are few, would be appropriated for the purpose by the enemy. If left altogether unwatched, however, an occasional boat might from time to time make use of them as of others previously noticed, finding herself outside and unable to evade the blockaders off her own, and lying so till night helped her to make a fresh attempt. We would propose therefore to allot two flotillas of five destroyers each as responsible for this part of the coast as far as Ushant. Both flotillas would work from St. Heliers, the Trieux dividing their beats, one taking the coast and anchorages eastward of its mouth, and the other those to the westward. As it would at all tides be possible for a torpedo-boat to get so far up the Rance or Trieux rivers as to be out of sight from the sea, a pair of the destroyers of the first section would lie off each, the fifth being absent coaling at the base, and the relief and coast patrol arranged as follows. The absent destroyer would leave St. Heliers at daylight, and commencing at Cartaret follow the coast at a speed of eight or ten knots, examining such few harbours in passing as could perhaps hold an enemy's boat till she arrived off the Rance before dark. Here she would take the place of one of the pair at that point which had already left the same morning to search in a similar manner westward as far as Trieux. This one would here relieve the one longest away from the base, which in her turn had left at daylight for St. Heliers, and, having only 40 miles to run, ought to arrive in time to spend 20 hours or more in harbour before starting on the round again next morning. This would ensure a thorough inspection of the coast every day, and a sufficient watch on the only two fairly important harbours at all times. The second flotilla would take up the line from the Trieux river westward to Ushant, having a pair of destroyers off Tréguier and another off Morlaix at night, and combining the duties of reconnaissance and relief in the same way. If it was found that this entailed too constant a round of work for their endurance, a sixth destroyer would be added to each division. That, however, ought not to be necessary, for unless having to chase they would only put in about 12 hours' steaming altogether in five days at a speed of 10 knots, the rest of the time being spent off these harbours mentioned either at anchor or moving slowly as requisite

to maintain position, and the amount of coal consumed would not exceed 20 or 30 tons on each round. In most cases it would be possible to get sufficiently close to sink a torpedo-boat discovered inside at her anchors, but if not, the destroyer would lie off till she attempted escape. Should it be found that a larger class frequently used these refuges a torpedo gun-boat taken from the blockade elsewhere would reinforce the patrols.

This takes us as far as Brest. The blockade of this magnificent harbour, as in the past, must always be an undertaking of the utmost importance, probably one of the central operations of the war. Of their small craft it has been supposed that the enemy have five torpedo gun-boats and 30 torpedo-boats here. This number might perhaps be larger, were it not for the fact that the place is rather far from the line which traffic can take if necessary, and therefore not altogether suitable as a base for its attack by these classes. That a certain proportion, if not the majority, of their big sea-going cruisers would use it however, seems almost inevitable, and this inshore blockading force would in consequence have a very onerous duty to perform. Its constitution has already been suggested, but its method of conducting the work in hand will be dealt with further on in Section B, which treats of protecting trade on the open ocean, a matter greatly dependent on the way in which this work succeeds.

This completes a general scheme, adequate or otherwise, and subject to modification when necessary, for blockading such of the hostile small craft as are in the Channel ports. As previously stated, it is supposed to be quite independent of the main fleets where possible, although if they also were operating in the Channel the arrangements might require a few alterations.

It need only be noted further at this point that bad weather would drive the blockaders at least to shelter, but would affect the enemy just as much by preventing their exit.

In spite of all these precautions however an escape might from time to time be effected, and it would be advisable in consequence to guard the line of traffic to some extent on the line itself, and lastly the night anchorages already noticed. In attacking the former it has been observed that a belligerent ship or boat must use extreme care to avoid sinking a neutral. A gun-boat or fast liner might be identified on a clear night if fairly close without recourse to the search-light, but not a "tramp," to distinguish one of which it *must* be used and at once reveal the attacker's own proximity. To utilise the advantage herein therefore, the best plan we can think of would be to purchase a dozen old cargo steamers, and set them to patrol the line on clearly-defined beats of 30 or 40 miles, having first supplied them with 6-pounder quick-firers mounted without shields as unobtrusively as possible, and a search-light. This would cover the distance from the Scillys to Norfolk. A torpedo-boat encountering one of such would close, and turning on her light, find herself unexpectedly the recipient of some 6-pounder shells while focussing its rays. Even if she escaped undamaged she would be in all probability reluctant to expose herself to such a risk again, and the knowledge of this state of

affairs might go a long way towards checking such attempts. These ships could be, partially at any rate, manned by the Naval Reserve, and would have orders to fire without hesitation on any ship approaching close and showing a search-light, which had not first made the private signal. Occasionally by the necessary risks of war one might be sunk, but this would entail no loss to commerce, and she could easily be replaced.

Such extemporised patrollers however could not hold their own against a torpedo gun-boat. The escape of the latter would be a much rarer occurrence than that of a torpedo-boat, as they are fewer in number and more easily observed, but should, nevertheless, be prepared for. To meet this, we would propose a patrol of the line from Dover to a point 30 miles S.W. of the Scillys by our own vessels of the same class. Beyond these limits the enemies' could not go if they wished to be back again by daylight, and if they did, would be dealt with by the force engaged on protecting open ocean commerce, as considered hereafter in Section B. Nine ships of the "Renard" class could carry out this patrol, working westward and back to the next of each of the following points:—Dover, Beachy Head, St. Catherine's, Portland Bill, the Start, the Eddystone, the Lizard, the Scillys, and 30 miles S.W. of the last, coaling as needful at the nearest harbours. This would provide a line making it a reasonable probability that a hostile gun-boat on the trade route would be soon intercepted. It would further be advisable to arrange by Board of Trade directions that any merchant-ship menaced by an enemy should immediately commence firing a succession of rockets. Even in the day-time these show a long distance, and would attract at once the nearest defending gun-boat, and might, to some extent, intimidate the enemy by the apprehension of such being the case.

There arises next the question of protecting the ships in the night anchorages previously mentioned. Two of these, the Solent and Plymouth Sound, form the immediate approaches to our central naval bases in the Channel, and their defence is consequently a matter rather outside the actual scope of the essay. It seems to us permissible to assume, however, that if sufficient for the national fleets, it would also suffice for the mercantile shipping, and we will consequently take it for granted that such is the case. The Thames estuary, on the other hand, is chiefly a commercial waterway, and although men-of-war do at times lie off the Nore, this anchorage is not used with anything like the same frequency as the first two, and has no protection of a local form in the way of forts, breakwaters, etc., nearer than Garrison Point. To effect the defence of the shipping here, therefore, one plan might be as follows:—The river's mouth below the Nore is divided by shoals into six separate channels, of which three—the Duke of Edinburgh, Alexandra, and Princes—lead to the southward. Of these three the Alexandra is the narrowest, and most easily guarded, and could be made the only practicable one by removing the buoys in the other two along with the Girdler and Edinburgh lightships, and shifting the Black Deep lightship to the northern end. A Thames pilot of over thirty years' service not long since told an officer of our acquaintance that even with all his experience

he could not undertake to bring a ship up if the buoys in the main fair-ways were removed, the tides being strong and complicated, and the land, when visible at all, too flat and distant to give reliable bearings, even by day. It is, therefore, scarcely likely any foreign officer could get through at night. To make this more secure still the Tongue lightship might be moved to the north-eastward, so that if an approaching enemy shaped course by it to make the Edinburgh channel she would run on the Long Sands; but a friendly ship could still make the Alexandra by steering for the lightship at the southern extremity which would be in sight.

The Alexandra is contracted at its narrowest part to a width of under 500 yards. Two coast-defence gun-boats with quick-firers and good search-lights, anchored on either side of this passage, could render it very difficult to be forced by a gun-boat or torpedo-boat. Three or four ordinary small tugs or vedette-boats lying to the southward could close and hail passing ships, warning the gun-boats by rocket or gun-signal if anything suspicious approached. It might be found advisable to place another couple of gun-boats in the Edinburgh channel, but if so they would have to be most careful to obscure all lights, which would otherwise give the enemy some indication of the fair-way.

The entrance to the Black Deep, the next channel to the Duke of Edinburgh outwards, lies 19 miles from it to the north-north-east. This one is 17 miles long, and is never navigated at any time, having no buoys nor leading marks whatever. It is, therefore extremely unlikely that an enemy would attempt its use at night with such dangerous shoals as the Long and Sunk Sands on either hand. To make this further certain if the Long Sand Lightship were moved 3 or 4 miles to the south-south-east the enemy could get no guidance to the entrance of the Deep, and as the lightship is only of use to the traffic passing the Thames estuary in standing to the northward or southward, such a change in her position would make very little difference to shipping, as she would still mark the safe line to the eastward of the shoal ground. If considered necessary, a coast-defence gun-boat could be anchored at the junction of the Deep and Edinburgh channel as a still further precaution.

The Barrow Deep is next again to the northward, also unbuoyed for navigation. The same arguments against its use, therefore, would apply; but as it is shorter, there is just a chance that it might be used, and perhaps more reason to station a gun-boat here in consequence. It is, however, narrower than the Black Deep, and in that respect more easily defended. If, in spite of the risks, an enemy did decide to try the passage of either of these, they would be compelled to move slowly and keep the lead going—a serious drawback when so limited as to time.

The Channel carrying all northerly traffic is the King's Channel or Swins, which is very narrow just above the Swin middle lightship, where it could be as easily held as the Alexandra. There is, moreover, the additional safeguard in its case that a boat starting from Calais or Dunkerque would have to steam nearly a hundred miles before reaching a ship at the Nore, if using this channel. Two gun-boats here would

make up a total of eight or ten for the defence of the Thames entrances, supplemented by a few tugs or vedette-boats, which completes the scheme for protecting the trade round the English coasts where it is within reach of the attack of torpedo-boats and torpedo gun-boats. The estimated total of ships required for blockade, patrol, and harbour guard amounts therefore to twenty-seven torpedo gun-boats, fifty destroyers, sixty-one torpedo-boats, eight or ten coast-defence gun-boats, and a dozen armed steamers specially acquired for the purpose. This is exclusive of the defences of the Solent and the Sound. If such an arrangement were well carried out, it would seem to us reasonable to hope that the attack on commerce by small craft would be a difficult and dangerous operation in these waters.

It has been assumed for the sake of illustration that half the French torpedo-boats, and half the total number of French and Russian torpedo gun-boats are in Channel ports. Of the remainder it is, we think, safe to predict that the majority at any rate would be in the Mediterranean, especially if the enemies' main battle squadrons had retreated beaten to their bases in that sea, of which Toulon would be, for many reasons, the most likely selection, unless they were hard pressed, and nearer Bizerta. But however that might be, both Algiers and Bizerta are well suited and situated for waging this particular kind of warfare, and would probably be used whether the main fleets were on the north or south coasts of the Mediterranean if the enemies' boats could once establish themselves at these places. Oran is also favourably placed but feebly defended, and could be dealt with as in the case of similar Channel ports. Of the ten torpedo gun-boats and ninety torpedo-boats left, a moiety at any rate would be with the fleet however, and probably a few at Saigon; and to make a rough estimate for the sake of illustration as before, it will be assumed that three torpedo gun-boats and twenty torpedo-boats would lie at Algiers and Bizerta each.

The first noticeable point in connection with the Mediterranean line of traffic which has now come under treatment lies in the fact that although the shortest, and in peace-time natural, route to the East, takes ships close along some 500 miles of the supposed enemy's African territory, it is by no means necessary to adhere to this in war through the limitations of space imposed by an opposite coast, as in the Channel. Ships can, if they choose, keep a clear 85 miles at least from dangerous points, and only add 50 miles to the distance between Malta and Gibraltar, if they keep on the line joining Cape de Gata, Formentera, Cape Spartivento and Maritimo, the distance on this track being almost exactly 1,000 miles, as against 950 by the ordinary one.

To protect the trade thereabouts, blockades should, we think, be the first step; but they would differ in some important features from those in the Channel, for we have no territory of our own sufficiently near the above-mentioned ports to be suitable as a base for use by anything smaller than a torpedo gun-boat.

As a means of partially overcoming this difficulty, we would propose

the seizure of the Habibas Islands group (which lie 215 miles to the westward of Algiers), and the Island of Zembra. At the first the destroyers or torpedo-boats employed to blockade Algiers would obtain their coal and supplies from colliers despatched from Gibraltar. The distance to be covered in passing between the blockade and this base would be, however, a serious drawback in necessitating a large expenditure of fuel on each trip, to obviate which perhaps the best plan would be to utilise the services of two steamers or old cruisers unfit for duties where high speed was required, to tow them backwards and forwards in threes at a time. By this arrangement twelve or thereabouts would always be away, that is, six actually at the base, and six on passage one way or the other. Taking the time as two days for a towing steamer to go and return with reliefs, and four days as the approximately safe limit of each period on blockade, twelve more would be off the blockaded port, making up the total to twenty-four, of which half might be destroyers and half torpedo-boats. If the weather became too bad for them to remain, which, except for an occasional "levanter," would be seldom, they would have to run to leeward, either to their own base, or, if the wind was westerly, to Zembra, the base of the Bizerta blockade. Of course, at such times the enemy's boats could not come out. The torpedo gun-boats could work from Gibraltar, and with advantage to the general scheme be made to carry out the additional duty of reconnoitring the anchorages between that point and Algiers in coming and going. We presume that this would be a necessary part of the whole operations for the same reasons as on the Channel coast. This combination of blockade and patrol could be effected as follows:—

Every morning a gun-boat would leave Gibraltar, and steaming 10 knots or so as requisite, pass along the coast within reconnoitring distance from Ceuta to Cape Tresforcas, off which she would arrive before dark. From this point she would proceed during the night straight for Oran, at the speed necessary to be there before sunrise, and continue the reconnaissance eastward thence to Cape Tenez at an easy rate of steaming, so as to reach that again before night. From Cape Tenez she would shape course direct for Algiers, and join the blockading force here next morning. Two ships bound towards Algiers would thus search half the whole coast so far every day, while the intervening spaces forming the other half would be similarly inspected by two others working back to Gibraltar for coal. Off Algiers there would always be not fewer than four, retiring to a fairly safe distance in separate directions on dark nights, on account of the enemy's torpedo-boats. To continue the coast patrol as far east as Cape Ferro, the gun-boat longest on blockade would each morning start on the arrival of her relief from Gibraltar, examining it at an easy speed up to the Gulf of Bujeyah, which she would reach by 6 p.m., and steer thence by night to Cape Ferro. Having this Cape abeam at daylight, she would head westward again, and spend that day in sweeping the coast back to Bujeyah, the next between Algiers and Tenez, and the third between Oran and Cape Tresforcas, always making a straight course from point to point at night,

and anchoring in Gibraltar Bay on the fourth morning early, having been under way ten days altogether, at economical or slow speeds unless having to chase. Allowing three days for coaling, etc., after each round, thirteen gun-boats in addition to the twelve destroyers and twelve torpedo-boats, would be therefore required to carry out this plan for blockading Algiers, and reconnoitring the coast between the Straits and Cape Ferro. This, at first sight may appear an excessive estimate, but in almost any kind of warfare the total force required to attain a given object must increase with the distance of the point of operations from the base, because a proportion of the whole increasing directly with this distance must always, for various reasons, be between the two. In the present instance, the number so situated would unavoidably be greater than of those actually in sight of the enemy.

East of Cape Ferro, the coast inspection would be taken up by the Bizerta blockading squadron, whose beat would extend as far as Ras Kadijah, beyond which the coast recedes remotely from trade routes. This squadron would operate with either Zembra or Galita as a base, preferably the former. Every morning a gun-boat leaving Zembra then in the same way would pick up the coast-line at Cape Farina, carrying the search to Cape Serrat, then standing across by night to Cape Ferro, where she would exchange signals at daylight with the patroller from the westward, and turning back to examine the interval missed by night, join the watch off Bizerta the same evening. This would be made up of four gun-boats and ten destroyers, every morning the gun-boat longest on the spot, leaving to patrol the shore line eastward by two stages as far as Ras Kadijah and back to Zembra, on the same principle of alternate stretches by day and night. On arriving at Zembra, she would have been seven days absent, and allowing two days' rest after each round for every ship, there would always be two here, raising the total to nine gun-boats assisted by ten destroyers. The latter could easily work from Zembra, which is only 40 miles distant, with good anchorage. Malta is within 15 hours' steaming of this base; and perhaps it would be useful to connect both Zembra and the Habibas group with Malta and Gibraltar respectively by temporary telegraph cables.

By this plan, the whole African seaboard from Ceuta to Ras Kadijah, 1,000 miles in all, would be daily reconnoitred throughout, and the two ports available as hostile bases placed under surveillance, the force estimated as above for the purpose amounting to 22 gun-boats, 22 destroyers, and 12 torpedo-boats; the enemy having about 6 gun-boats and 40 torpedo-boats distributed on the line by our previous supposition.

A further force, however, would be required on the trade route itself. This comes within range of a torpedo-boat's night-work for a distance of about 150 miles opposite Bizerta, but nowhere else. Five or six of the armed steamers previously suggested might therefore be of use here. As regards attacks by gun-boats, we hope to show that the trade would be more or less protected by the scouting cruisers of the Mediterranean battle-fleet when considering commerce protection on the open seas.

B.—The Defence of Commerce on the Open Oceans and Mediterranean from the Attack of large Cruisers.

The western part of the Mediterranean assumes a "funnel" shape, and is contracted to a width of 80 miles between Cape de Gata on the Spanish coast and the Habibas Islands on the African. Two hundred miles west of the nearest point of a line joining these two and about 40 west of Gibraltar the distance apart of the coasts is roughly 30, the northern point of a meridional line joining them here being Cape Trafalgar. If a cordon of cruisers were drawn across each of these lines, the two cordons would therefore be about 200 miles apart (rather more at the southern extremities), and a ship attempting the passage of the Straits would necessarily pass either the eastern or the western of them by daylight and be sighted, unless having slipped through one and being in some manner forewarned, she chose to take the risk of easing speed so much as to spend the time between sunrise and sunset in the intervening space on the chance of avoiding discovery, of which however there would be small prospect, with a little arrangement, for the following reasons. The torpedo gun-boats, etc., reconnoitring the African shore *en route* to Algiers by the scheme previously given, would sight her if within 10 miles of that coast. Along the Spanish side a cruiser, standing to join the eastern cordon, would pass every day, and the capes and headlands would be provided with a staff of our watchers or agents in telegraphic communication with Gibraltar; while the water space between the two shores, and out of sight of both, would be also daily swept on separate lines by our ships travelling between the "Rock" and the cordons on relief for coaling, etc. As regards the cordons themselves the southernmost cruiser of the eastern one would lie 5 miles to the northward of the Habibas group, the northernmost 10 miles to the southward of Cape de Gata, whose height gives it a wide horizon. The total stretch between these wing ships would therefore be 65 miles, filled in by ten others equidistant at intervals of about six. The Habibas lighthouse would, with the islands, be in our possession, the latter being used by the scheme already suggested as a base for destroyers, and that on Cape de Gata would presumably show up as usual, the ships near the extremities of the line being consequently able to keep their positions without difficulty at night, and by occasionally flashing a search-light helping those near the centre to do so; the whole adjusting bearings and distances every morning at sunrise as they shifted to the next position in the daily round of relief. Those of the western cordon would similarly maintain their line by the lights on Capes Trafalgar and Spartel. To carry out the necessary relieving work of the eastern beat combined with the duties of searching the intervening space daily, the ships employed thereon would be divided into two equal separate lots, one taking the northern and the other the southern half of the area to be guarded and examined. Every morning just before daylight a cruiser of the northern section would leave Gibraltar, and,

skirting the Spanish coast at a distance of 20 miles or so, take up position in the evening off Cape de Gata as the northern wing ship of the chain. The first five from the northern end actually on the line would move slowly during the day across the 6 miles necessary to occupy the position vacated by the next to the southward, the sixth and southernmost starting back towards Gibraltar at daylight, keeping a good all-round look-out on the way, and arriving before dark. The southern division of the cordon would work on a similar plan, the area between the cordon and the Straits being thus daily sifted by vessels moving on four different lines to and from the latter, in addition to the African coast patrol. Each ship by this arrangement would be a week under way between coalings, but except for the total 24 hours or so spent in coming and going to her station the time would be passed with engines stopped or moving dead slow, and the coal consumed trifling in amount, making it possible to use vessels of small coal power, such as the "Iris," etc. Eighteen could do the work without undue stress. For the western chain six ships would be employed on the line, a seventh being away for coal; but as it is so close to Gibraltar, force would be wasted in having both one going and one returning every day, and the small amount of enclosed space could be cleared on alternate days instead, by first an eastward and than a western-bound cruiser of the squadron. A spare ship might be advisable, raising the number to eight, which, with the eastern or inner cordon, would make up a total of 26 as necessary for closing the Mediterranean. Fogs and thick weather would, of course, hamper them at times, but these would, with the strong currents of the Straits, also seriously trouble an enemy. We can well recollect an occasion in which a ship we were serving in sighted the Est-epona light instead of Europa Point for which we were making, and another in which the whole Channel Squadron altered course to the northward for Gibraltar Bay under the impression they were half through the Straits, when really 20 miles to the eastward. Taking all things into consideration, therefore, we think the above scheme seems likely to make the attainment of the object as nearly a certainty as anything in war can be, which only phenomenal luck on the part of the enemy would frustrate. If they had no cruisers suitable for ocean commerce destroying in Mediterranean ports these ships would still be useful in preventing such from getting in, and in addition to this perhaps a watch on the Mediterranean exit might occupy a place in the higher main strategy of the war—which is beyond the actual subject under discussion.

There is next the question of protecting traffic in the Mediterranean itself, which, it must be confessed, seems to us a difficult one. The opinion is held in many quarters that during war we must give up the occupation of this sea altogether; but that idea will certainly not be supported here. The safe-guarding of the Suez Canal has been already referred to, and as long as that holds good, our trade through it must continue for the sake of its own interests and existence. Nevertheless, it remains a fact that the number of strong positions possessed by the enemy flanking the western half of the main route constitute a most

potent menace; while the attempt to attain the effective blockade of Toulon would be met by great obstacles if the enemy were there in any strength, for it would not be worth the risk to expose our battle-ships and large cruisers to the chance of successful attack by torpedo-boats, and they would therefore have to keep their distance. Destroyers and torpedo-boats attempting to blockade the place would consequently be comparatively unsupported, and what is worse, have no base on which to retreat or act from. The Hyeres Islands are so close to Toulon and the mainland that even if we seized them they could always be retaken in a few hours, and moreover, in southerly winds the destroyers would have no shelter, unless they moved to the anchorage north of the islands, which is within range of artillery on shore. On these conclusions such a blockade would appear to us a most unadvisable operation to undertake. But, again, it would not do to trust the protection of the important eastern trade route to single cruisers dotted along it at intervals without further support, which might be attacked in detail by superior force comprising even battle-ships, and driven off. The defence of British shipping, therefore, in the western basin of the Mediterranean becomes apparently a question directly and unavoidably dependent on the main strategy of the war in these parts, and must take its stand upon the fact of our having a fleet of fast battle-ships on or near the main line superior to any which the enemy could throw upon it. If this were so, it would not be worth their while risking the loss of some of their finest vessels for the mere object of harrying our trade for a few hours (it could not be longer), and, indeed, we might conceivably wish for nothing better than that they should make the attempt as placing them within reach. Fortunately the distance to be guarded is small, extending approximately from Formentera to Sicily, and with twenty cruisers properly disposed their whereabouts ought very soon to be known if at sea. It is scarcely probable that they would push further west or east than these points, as our fleet might then get between them and home, and of course the latter would remain as far as possible out of sight of land to add to the enemy's risks by giving no clue to their movements. If near the line of trade suggested beforehand as being at a safe distance from the African coast, little or no information could be obtained from neutral shipping by the enemy, which would presumably adhere to the usual route and thereby pass at least 80 miles off to the southward. The twenty or more scouts of this fleet would provide the best defence along the line against the raids of single cruisers. If these raiders occasionally resorted to Algiers and Bizerta as refuges, a destroyer or gun-boat immediately despatched from the blockading force would fetch across the nearest large cruiser of ours to reinforce. One cruiser would always lie at or near Marsala in telegraphic communication with agents at Messina to receive instant information of the presence of the enemy in that quarter, and report the same without delay to the battle-ships. The chief drawback, of course, to the plan would be the distance from a base; but that appears unavoidable. Regrets are usually a waste of time, but still, on looking at the chart, it is impossible to help being

struck with the difference the whole question would assume if the British flag still flew over Minorca.

East of the Malta Channel the danger to trade from attacks in force would probably be lessened by the increased distance from the enemies' bases. Single cruisers, however, might even here effect damage, and it would, therefore, presumably be advisable to have some six or more of ours patrolling a circuit with Malta, Port Said, and Smyrna as the main points on the line. The Black Sea trade would necessarily be dropped altogether, but as the greater part of it runs to Russian ports, this would be one of the consequences of the war in any case. If the steamers of the Volunteer Fleet proved troublesome by emerging from the Dardenelles a few more cruisers would be required to meet them, and if not available we should have to fall back on the services of our own fast armed auxiliaries; but as this Volunteer Fleet only includes four steamers of any speed, and some of them would be in Siberia, or at points on the way, the preventive force would not require to be numerous.

The protection of Mediterranean trade from attacks of various natures is thus more or less provided for, the estimated force for the purpose as shown amounting, exclusive of battle-ships, to 26 cruisers, 22 torpedo gun-boats, 22 destroyers, and 12 torpedo-boats, and the western entrance closed to attacks from outside by 26 more cruisers. The first would combine this duty with that of scouting for the battle-ship squadron, which appear here to be necessarily connected from the nature of the surroundings. This estimate has been based on the supposition that the enemies' principal force is in Mediterranean waters. If that were otherwise a redistribution of our ships would take place, and the problem here would be greatly simplified, a proportion of cruisers sufficient to deal with those remaining of the Alliance being disposed as best along the main route, but the double cordon across the Straits always kept at full strength, as much to prevent outside enemies from getting in as those inside from getting out. A limitation would thereby be placed on both, which ought to facilitate the work of following them up by restricting the scope of their operations.

Ships entering or leaving the Baltic must pass through the Great Belt, the Little Belt, or the Sound. The two latter are contracted to a width of half-a-mile in the deep channel. The first has a width of about double that opposite Korsor Point, and three miles opposite the western extremities of Laaland and Gniben Islands. With eight cruisers, nine or ten destroyers, and half-a-dozen torpedo-boats, disposed as follows, no ship could enter or leave without detection, unless by some extraordinarily fortuitous combination of circumstances. Beginning at the inner end, one cruiser (the most powerful one) would lie in the middle of the channel, east of the southern junction of the Belts, and between the south point of Laaland and the German coast, in what it is proposed to call position A. Attended by a couple of destroyers, the three could easily watch the 10 miles span of water, and it would be impossible for anything to pass undetected by daylight. Eighty miles in rear of her (outwards), a single destroyer would lie in the gorge of the fair-way

between Korsor Point and Nyborg in position B, and another cruiser again 50 miles in rear of the destroyer, and just to the westward of Siellands Reef, where the combined Belts join the Cattegat at C; five more destroyers daily sweeping the Cattegat from east to west and back, or *vice versâ*, between the south shoals of Laeso Island and Siellands Reef at equal distances of 7 or 8 miles, the distance across being nowhere more than 60. Off Laeso, at some point to leeward exactly known from day to day to these destroyers, would be a third cruiser at D, and finally at E four more forming the outside chain between the Skaw and the Swedish coast; one other, with a destroyer and six torpedo-boats, lying in the narrowest part of the Sound, in case an enemy should elect to use that exit. The operations of this squadron ought to work out as follows:—A hostile cruiser trying to get out must, if travelling by either Belt, first pass the big ship in the advanced inside post A. She might succeed under cover of darkness and push on; but, if still dark, would be very unlikely to risk the dangers to navigation in the Little Belt, although, if she did, the difference would be immaterial to us. Should she take the Great Belt, as is probable, she must next pass within half-a-mile of the look-out destroyer off Korsor Point at B, and, if still protected by darkness, might even here, with exceptional luck, get through. If sighted, however, either by day or night, she is practically trapped, the destroyer at once spurting off to warn the cruiser C of her approach, and if she turned to run she must again pass A, this time by daylight, unless she turned off into the Little Belt where she could be followed, and must anyhow eventually pass D and E.

Supposing, on the other hand, she escaped observation at B, and yet again at C, she would then enter the wider waters of the Cattegat eight hours after passing her first danger, if she was an 18-knot ship, but darkness would not continue under any circumstances sufficiently long now to cloak her passage through the last, the line of cruisers 120 miles still further on across E. But neither could she afford to ease speed and wait till evening again, the intervening space being daily reconnoitred throughout except over shoal ground by the six destroyers so detailed, any one of which sighting her, at once proceeding to inform the cruiser lying in wait at D. If she took the Little Belt as an alternative she would avoid the destroyer at B, but have a greater distance to travel through a most intricate channel; in any case passing C, D, and E, under the same disadvantages as before; whilst, if she tried the Sound, it would be practically an impossibility for her to make the passage of a fair-way only 1,000 yards wide, with a cruiser, a destroyer, and half-a-dozen torpedo-boats drawn across it. She might attempt to lie up for the day in the Little Belt, after crossing A at night, but this could be prevented by having a staff of watchers on Fyen Island to telegraph the occurrence to B or C and bring them to ferret her out. It would be very advantageous, but not absolutely necessary, to have two or three torpedo-boats in attendance with the destroyer at B. The narrow channels and intricate passes of the Baltic entrances are particularly adapted for such craft, whose operations would be further facilitated by the number of well-

sheltered anchorages and even depth of water everywhere except in the extreme northern parts of the Cattegat. It seems possible to us that perhaps old broadside battle-ships well-armed might be useful at the contracted parts, where a passing enemy would be forced to come within range, whatever her speed.

With the exception of the one in the Sound, the positions of the cruisers are all outside the 3-mile limits however, and they would of course endeavour to avoid the violation of territorial waters. Should an enemy take refuge in such, the cruisers on the spot would simply have to watch her till she left. There would be no difficulty in coaling and provisioning the force so engaged by steamers from Aberdeen or Leith, the work being carried out at anchor where convenient, if necessary beyond territorial limits, for which the shoals afford a number of suitable places. An enemy endeavouring to enter the Baltic, and therefore passing the ships in the reverse order, could be dealt with in a similar way, except that, if first sighted by a destroyer, the latter would proceed to report her to the next cruiser to the southward instead of to the northward. Finally, it might be advisable for the cruiser at A to send her destroyers for an incursion to reconnoitre the coast to the eastward by daylight occasionally, on the chance of a Russian torpedo-boat working along from Memel, and perhaps even to anchor after dark with nets out, as her duty would lie more in keeping a look-out in the day than at night. This scheme is suggested for use at the equinoctial periods. In summer the very short duration of darkness would admit of a reduction of the force by two-thirds, and in winter they could be withdrawn altogether, the Russian ports being closed to their cruisers by ice.

Having then closed the Mediterranean and Baltic, and thereby forced a comparative concentration of the other cruisers to be watched, by limiting their choice of bases to those on the French northern and western coasts, it becomes necessary to consider how best to proceed in dealing with these. The ports suitable for use are Cherbourg, Brest, L'Orient, and the River Gironde. L'Orient, however, can only be entered "at high tides" by vessels drawing 18 feet, and not then on the Atlantic swell.

The entrance to the river Gironde (to deal with that first) is peculiar in offering facilities for absolute enclosure which are not characteristic of any of the others. This arises from the extent and contour of the embouching shoals lining the fair-way to a distance of 4 or 5 miles from the coast. At a point about 3 miles out, the North Channel (used by ships drawing over 15 feet) is contracted to a width of about 900 yards, and has a depth at low water of 6 fathoms, affording an admirable opportunity for blockade by mines or sunken hulks. The latter would probably be the most certainly efficacious if most expensive appliances of the two, and once placed require very little watching, being most difficult to remove; whereas, if mines were laid, gun-boats must constantly be on the spot to prevent the enemy from clearing them away. Ten old hulks, wooden or iron, filled with shingle, would answer the purpose, the operation of placing them being completed in two or three slack tides, and suffering very little interference from artillery on shore at the distance, if

carried out at night. To clear a passage through such an obstacle would be a long and tedious bit of work, requiring divers, and therefore easily prevented by the occasional visit of a cruiser. The south or "De Grave" passage of the river is only practicable for vessels of under 15 feet draught; but as there are several small cruisers of this description in the Navies of the Dual Alliance, provision to close it in a similar manner would be advisable, and another dozen of the old craft which encumber our harbours and reaches might so find a useful end to their career.

There would then remain only the harbours of Cherbourg, L'Orient and Brest to be watched, the latter the finest natural seaport on the Continental coasts. Inside these harbours it has been supposed that a fleet of the allied cruisers lie for reasons given, including some 20 of the larger ones. We might also assume that the same proportion, that is, a half, of their smaller cruisers are here, which would give six. To mask this menace on our commerce, we would propose first to watch these harbours with the utmost possible vigilance, thereby reducing the likelihood of immediately undetected escapes to the narrowest limits; and, secondly, to provide a force of about 40 cruisers so stationed, that, on receiving news of an escape, which must come sooner or later, whether from the blockaders or otherwise, they can take the best means of encountering the escaper. As regards Cherbourg, an arrangement for blockade by small craft has been already suggested, and the departure of a large cruiser unobserved by them would be a very rare occurrence. Being an open artificial harbour, if such a thing did happen, her absence from inside would probably be discovered at daylight, and at once reported to headquarters at home.

Brest and L'Orient are landlocked anchorages of the best kind. In considering the surest means of attempting to close them, it is a noteworthy circumstance connected with the subject generally, that the particular variety of coast-line which is usually rich in fine natural harbours difficult to blockade from the irregularity of its altitude, is also, for identical reasons, frequently well fringed with groups of islands which by supplying bases greatly facilitate such an undertaking, if sufficiently near a blockader's port to prevent the enemy having time to retake them before support arrives; supposing always, of course, that the enemy has the force inside to do it. Thirty miles from the entrance to Brest lies the island of Ushant, with three anchorages on different sides, suitable for destroyers and torpedo-boats, while exactly facing the headlands of L'Orient is the Isle de Groix at a distance of four. It is true that the bays round Ushant are rocky, with sandy bottoms, but a careful survey of each could easily be made, and any dangers marked, and they afford the advantage of being so situated that it is always possible to find a lee.

The first step, then, would be the seizure and garrisoning of these two islands; the second, to run a submarine cable without delay from De Groix to Ushant, and thence on to Plymouth, distances of 120 and 85 miles respectively, and these things would be done as soon as ever it became apparent that we were decisively getting the upper hand in fleet actions, and the attack on commerce was

a thing to be provided for from the want of other work for the enemies' cruisers. Having secured these bases, the watching flotillas would commence their work. That for Brest has already been provided for in section A, consisting of fifteen destroyers and twenty torpedo-boats. These would nightly take up their stations across the approach between the Pierres Noires and La Vendrée shoal, a span of about 3 miles. This line would be about 9 miles from the entrance, but vessels arriving or departing must pass through it, on account of the multitude of reefs and rocks lying to the northward and southward of the fair-way and extending this distance out. The buoys on Le Trépied and Beuzec rocks would be cut adrift if possible, to add to the difficulties of navigation, and the light on Pierres Noires either extinguished by us or so screened as not to show landwards. It might perhaps be possible to run a line of mooring buoys across (the greatest depth is about 20 fathoms) to help the destroyers and boats to keep position by picking them up and riding by a slip rope, with steam kept on the engines. A ship breaking through at any point would then have to get between two of them less than two cables apart, and pass within a cable of one or the other. If she attempted to use a search-light or open fire, her position would be at once revealed, and even if she escaped a torpedo, the fact of her being at large known to the Commander-in-Chief at Plymouth within an hour or so, a destroyer previously warned for the duty immediately starting for Ushant with the news, from whence it would be telegraphed across. In the very unlikely event of her passing unobserved, the knowledge would not be so immediate, but must come soon, as her work will tell its own tale, for even if not sighted and reported, the non-arrival of a succession of ships known to be on passage between certain ports and due on certain dates would be quite sufficiently suspicious to act upon, although in such a case time had unavoidably been lost, and a certain amount of damage done.

This cordon of destroyers and torpedo-boats would undoubtedly at times be driven to seek shelter by Atlantic gales. When such was the case the look-out would have to be taken up by eight or ten, or as many cruisers from Plymouth as could be spared; but these could neither get so close in, nor form so effective a watch as the former, although obtaining one great advantage in having nothing to fear then from torpedo-boats. By remaining near the line joining the Pierres Noires and the Chaussée du Sein they ought however to have a fair chance of intercepting a blockade runner; for a ship driving through heavy seas is, even at night, much more likely to attract notice than one slipping past in a calm. The lights on the two rocks ought to be in our possession, and screened so as to show only to seaward, which would oblige a ship coming out to keep more nearly in the centre of the channel on a dark night; those on the Isle de Sein and Trevenec and Vielle rocks being destroyed to prevent her taking the dangerous Raz du Sein passage. Most of the mainland lights would probably be extinguished by the enemy, a circumstance acting, however, favourably in one way for us, by making it difficult for an arriving hostile ship to get

in at night; and remembering this, the mere fact that Capuchin Point was lit up might be taken as a warning that something was on the move or expected. At the same time, it would be well for the blockaders to place no trust in these, as they might be purposely shifted in order to mislead. That the enemy might at times emerge in force and drive off the destroyers would be, perhaps, a thing to be expected, but not to cause much anxiety, the latter having the speed of any cruiser yet built or building, and simply retreating as far as necessary, keeping a careful watch on the movements of the hostile ships. If they returned to harbour, the destroyers would simply resume their positions, and if they continued to stand out for open waters, report by telegraph from Ushant, as before mentioned. In any case, such a sortie would be more dangerous to the ships attempting it than to the blockaders, if by night, on account of the great risk from the latter's torpedoes, and if by day, from the probability of falling in with our own cruisers further out. To provide for this, a second line of blockade, formed by six or eight of such, ought, we think, to suffice in most cases, closing to within sight of land every morning, and retreating beyond the reach of torpedo-boats at night.

The extensive use of L'Orient by the enemies' larger ships during war, is not, we think, very likely, the want of sufficient water in the channel restricting the egress or ingress of anything drawing over 18 feet to the periods between half flood and half ebb, and the watching flotillas, with their base on the Isle de Groix being consequently less liable to the attack of a superior force. On the other hand, this base is much nearer to the enemy than Ushant, and considerably further from support—facts which would necessitate a strong garrison. With some guns placed on the higher parts of the island they could be fairly secure against attack by a party conveyed in small craft. If ships with heavy batteries did happen to be on the spot, the occupation would suffer from temporary interference perhaps, but we could at least prevent the enemy from retaining it long. As this harbour, however, might be used by light-draught cruisers, a fleet of ten destroyers, or torpedo-boats, or torpedo gun-boats, ought to be told off, we think, to watch it, being equally divided between the northern and southern exits of the channel, dividing the island from the harbour entrance, and anchoring to leeward of the former in the daytime while a watch was kept from its summit. The temporary cable laid as suggested would convey information to Plymouth of the enemy's movements.

Two cruisers, detailed for the purpose, would constantly patrol and search the remainder of the Biscayan coast-line to prevent any hostile ship using the other anchorages, which are all fairly open to attack from the sea. This completes the force necessary to carry out this suggested blockade of the enemies' ships in European waters.

In the Far East, Saigon and Vladivostok are the two ports requiring attention. For the blockade of the former there is fortunately an admirable base fairly close at hand in the Island of Pulo Condore, at present, we believe, used as a French penal settlement; and, indeed, to attempt

anything like an effective blockade of Saigon without it could only be done by a very large squadron working from Singapore. To watch the mouths of the rivers a flotilla of six or eight destroyers and a dozen torpedo-boats ought to suffice, the former lying across the eastern or Don-nai branch, which is used by large ships, and the latter distributed as necessary among the Loirap and Cambodia outlets. It is not likely, however, that these would be much used, even by the enemy's small craft, on account of the numerous and extensive shoals. All the blockaders could anchor in the daytime out of range from the shore in six or seven fathoms, and at the same time be within sight of any ship coming out. Cape St. James affords good shelter during the monsoon to the water space in which they would work. They might even coal here at anchor if necessary, provided always that the collier was escorted by a cruiser in case of a sortie by the enemy. As a general base, however, Pulo Condore should certainly, we think, be obtained. It lies just 100 miles S.S.E. of the Don-nai entrance and has good harbours.

The undetected escape of a raider would be very unlikely from such a narrow outlet well filled with destroyers and torpedo-boats, but if this did happen, information would have to be conveyed to the blockading admiral with the utmost despatch from Singapore as soon as her depredations made the fact known, although a certain interval of time had been lost as in the parallel cases nearer home. If a cable could be run to the blockaders' headquarters at Pulo Condore, a distance of 450 miles, it would, of course, be invaluable for the purpose; but if for any reason this could not be done, the fastest steamer available would have to be sent.

Traffic passing through Saigon can keep 200 miles off without any appreciable loss of time, having nothing, therefore, to fear from torpedo-boats.

The blockade of Vladivostok, like that of Toulon, would have to be carried out under the disadvantage of the absence of any island sufficiently near and yet sufficiently distant for a base, for those in the offing are close enough to be retaken in a couple of hours. Unlike the case of Toulon, however, the neighbouring coast is wild and comparatively uninhabited, without good roads or communications, and the blockaders could therefore retire by turns to anchor at convenient places, and fill up from colliers without fear of interruption by shore artillery, avoiding, if possible, the too frequent use of any one particular spot.

It has been previously assumed that six or eight of the allied cruisers are in Eastern waters. To deal with them, therefore, as above, a force of ten or twelve of our own ought to suffice as a support to the destroyers, concentrated or divided between the two ports, as found to be requisite.

THE CHINESE QUESTION:
HOW IT MAY AFFECT OUR IMPERIAL INTERESTS.

By ARCHIBALD COLQUHOUN, Esq., F.R.G.S. (Gold Medallist).

Wednesday, March 9th, 1898.

Sir LEPEL GRIFFIN, K.C.S.I., in the Chair.

[THE subject treated in my paper covers so wide a field, is so many-sided, that it is impossible to present it in such a complete or attractive form as one could wish. To attempt that would require not one but many papers. All I can do in the space and time available is to indicate certain features of a great question in such a manner as may suggest to those who have already interested themselves in the subject, some fruitful lines of further study. Being thus limited, the treatment of such a complex question must of necessity be abrupt in form, and the decided views expressed without elaborate argument may not escape adverse criticism. Neither is it desirable that they should. Indeed, my object is to provoke discussion, and thus to arouse public attention to the critical position of British interests in the Far East. If I have pointed out the errors of the past it is only with a view to guide the country aright in the future. I have now, as I have always had, every confidence in the strong common sense of my countrymen to come to a right conclusion, if only once in possession of the facts of the case. "Light, more light," is what is wanted, to educate the country to its vital interests.]

In 1886 I said in this theatre:—"The Franco-Chinese War has opened a new chapter of international history which it is safe to presume was not in the contemplation of either party to the struggle. What was sure to happen some day in the ordinary course of commercial and colonial development has been accelerated by the French proceedings in Tonquin and China, and by the movements of Russia—the shifting of the political centre of gravity, the opening of a new and larger Eastern question, and the resumption in the Pacific of the struggle for pre-eminence which was carried on a century ago in the Atlantic. It is inevitable that the question of supremacy in Asia be shortly decided in favour of one or other of the Powers, Russia or Britain. In the coming strife England must in spite of herself play a leading part, since the material interests of the British Empire are by far the heaviest stake in the game. It is even probable that the fate of the Empire itself may be eventually decided in the Eastern Seas. It is therefore a question that concerns all

Englishmen in the mother country and India and the Colonies, and, indeed, all English-speaking people throughout the world, whether English statesmen will rise to the occasion, bringing courage, faith, and intelligence to bear on the direction of affairs, whether they will instruct the people in their true interests and responsibilities, teach them the vital importance of foreign affairs and national defence, or whether, calling upon the people to centre their attention on drastic semi-socialistic 'reforms,' in a lukewarm, vacillating, and cowardly spirit they will continue as of late years to embroil England and humble her before the nations, and finally cause her to drop out of the rank of Great Powers." The twelve years that have since elapsed have certainly not rendered these propositions obsolete.

That Britain is an Asiatic Power is a truism. But how little realised by our countrymen! England's Asiatic dominions and dependencies cover more than 2,500,000 square miles. She has 270,000,000 souls under her rule, speaking some twenty languages. Her European military strength in Asia is 75,000, with 150,000 native auxiliaries, while her naval force, thanks to recent reinforcements, is stronger than that of any other single Power, excepting perhaps Japan.[1] She has 21,000 miles of railway and 47,000 miles of telegraph on land in Asia, and some 20,000 miles of submarine cable. She has invested in her territories, either in State loans or railways under the State, over £250,000,000, besides scores of millions sterling invested in private enterprise—agricultural, commercial, industrial—which cannot be exactly estimated. The foreign trade with these territories is more than £160,000,000 annually, of which one-half is with England. The trade of other Asiatic countries with Europe is over £60,000,000, of which four-fifths is English, while an enormous coasting trade growing yearly with giant strides is mainly in our hands. The trade between Eastern Asia and our Australian Colonies, still in its infancy, is increasing and has a great future before it. But the point to which I desire specially to direct your attention is the unique position occupied by China and the Far East in the whole range of trade fields. The British share of China's total foreign trade is above 70 per cent. (Mr. Chamberlain, I notice, calls this 80 per cent.), or more than £32,000,000 per annum; while British trade exports and imports from the mother country with the Straits Settlements, Siam, China, Corea, the Philippines, Japan and Hong-Kong combined exceed £130,000,000 per annum.[2] This Far East trade is actually twenty millions more per annum than our annual trade exports and imports with India, and represents about one-sixth of our world-trade. And this on a virgin field for the greater part unopened

[1] The normal strength is:—1 first-class battle-ship, 4 first-class cruisers, 3 second-class cruisers, 2 third-class cruisers, 8 first-class gun-boats, 3 torpedo-destroyers, and some gun-boats for river service. Two first-class battle-ships and a first-class cruiser have lately been added.

[2] I quote these figures from the Hon. T. H. Whitehead, M.L.C. of Hong-Kong and F.S.S., a high authority on Far Eastern trade, who doubtless treated the question from a comprehensive Imperial point of view.

and capable of indefinite expansion! These facts ought to be written up in every newspaper office in the country, in every politician's study.

The Asiatic dominions or dependencies of Russia, measured by area, are close upon three times as great as our own, containing over 7,000,000 square miles. But they have only a population of some 18,000,000—*not one-fifteenth of our Asiatic population*—scattered over this enormous region, which in economic wealth is extremely poor compared to our own. It is these simple facts which make the rapid advance of Russia towards India and China in the present generation so significant. From the shores of the Caspian as her base she has, at enormous sacrifice of life and treasure, thrown forward a vast network of communications through Central Asia towards India, whilst in Siberia and the Amur region she is making great efforts to consolidate herself and to perfect the communications between the Pacific and European Russia. She is every year occupying a stronger position, from which she can put in practice her policy of exerting pressure upon the Indian and Chinese frontiers, and thus gain what she wants—strategic positions—on the seaboard in the east and west. The completion of the Siberian railway and its branches will mark a most important epoch in her advance. Her trade with Eastern Asia, consisting almost entirely of tea from China, is insignificant.

The force which is constantly, silently, at work in this Eastern Question—this *Drang nach Osten*—the factor which can always be reckoned on with certainty, is the irrepressible but not unnatural ambition of Russia, which impels her incessantly from the Arctic frosts towards the open sea, a movement which presses on Turkey, on India, and on China, and in a minor degree on Persia, in a continuous line of front, extending 7,600 geographical miles right across Asia, from the Bosphorus to the Yellow Sea. There is no need to trace here the history of the Russian advance across the barren and thinly-populated wastes of Central Asia and Siberia; enough to bear in mind that she is now on the frontiers of India and China, the objectives of the movement—objectives in a sense that will appear later. Obstacles may retard, but centuries do not change that movement.

Russia claims to be simply obeying a law of sunward and seaward gravitation, to be following the course of her natural development which must progress until it encounters the opposition of nations stronger and better than herself. But Russia is not an over-populated country throwing off its surplus population. She is engaged on a political or military conquest which, after enormous expenditure, has now placed her in an advantageous position for influencing, perhaps for menacing and even attacking, the two richest and most populous countries in Asia, one ours, the other the chief trading field yet open to our energies. She means to build up a commerce, but the seaboard and ports she wants in the first instance for strategic purposes.

The Trans-Siberian Railway, and its branches, will be one of the chief factors in shifting the centre of gravity of the world's trade. Its

effects seem to be viewed with complacency on our part, because the *existing* trade may not perhaps be greatly diverted. That will be much increased, however, and considerable changes must result, though slowly and perhaps imperceptibly at first. The eventual effect will be colossal, for the railway will open up enormous undeveloped regions, and will give facilities for the conveyance of passengers, correspondence, and the lighter class of goods—a most important matter when it is a question of connecting within a fortnight's time the capitals of Europe with those of China, Japan, and Corea, countries with a population of four hundred millions, one-third the world's total. A great portion of the Eastern section of the line will pass through a splendid country, Manchuria, quite a white man's country and full of valuable resources.

French interests in Asia consist of her possessions, comprising Cochin China, covering an area of 22,000 square miles, with a population of 1,700,000; Camboja 40,000 square miles, and a population of 1,000,000; Annam (including Tonquin) 250,000 square miles, with a population of about 10,000,000; in all, a population of some 13,000,000. The total trade represents merely some £7,000,000 sterling annually, of which a considerable amount is in British hands. But if France has little trade she has aspirations, aims, an idea.

The ambition of France, though continuous in idea, is spasmodic and incoherent in action. Its motive is political, not commercial. Commerce is only the stalking-horse. She is in an exceptional sense subject to the caprice of constantly-changing political parties. Her population is stationary. Her finances are in an unsatisfactory condition. She has no real Colonies, that is no "white man's" countries. Her military occupation has everywhere been a failure, except in Algeria, where she has a base close by in Marseilles. I do not altogether share the view that Frenchmen cannot colonise, but they will not go abroad to the Far East as colonists or even as traders, nor is this to be wondered at, seeing that France has no overflow population such as other countries have, or profess to have. Still France may, however dangerous we may think it may prove to herself, elect to play a prominent part in this Eastern struggle, as Gambetta and Skobeleff contemplated, and as under M. Ferry she was inclined to do. Tonquin has a rich delta, but is for the most part jungle-covered hill country, unhealthy, and uninhabitable by French settlers or traders. France administers the government with a great yearly deficit, merely for the benefit of (excepting a multitude of *fonctionnaires*), natives and strangers, more especially the traders of Southern China. Whether it is worth while for France to make the sacrifices she does for such an object is not for us to judge. The French have a saying: "*Les nations ne se servent que de deux langues—la guerre et le commerce.*" In our colonial expansion we begin with trade and sometimes end with war. The French commence with war and seem rarely to get beyond it. Russia begins with diplomacy and assimilates, gaining her way without conflict if possible, though when driven to it she wages war in a ruthless spirit. The French views with regard to Indo-China

and Southern China are now well known,[1] and are made no secret of by the French themselves. The Russian plans, notwithstanding "assurances," are also evident. What has never been understood, however, as I said in this theatre in 1886, is that "the theatre of European jealousies and rivalries has been extended from Turkey and the Levant to the China seas; and the Eastern problem of the future for England is Russia on the west, and France on the east, closing in on her Indian frontiers." Has this been realised during the recent discussion? Is it even understood now? Yet during these twelve years the Franco-Russian alliance, which was foreshadowed, has gradually come into existence, and is now in active operation, making our position on the N.E. frontier of India one of serious anxiety.[2]

In sketching the outcome of the Franco-Chinese War in 1886 I passed briefly over the possibility of a Franco-Russian alliance, because in the then unsatisfactory condition of politics in France and unfortunate position of affairs in Tonquin it was not right to say much on this subject. But I clearly showed that at any time a Franco-Russian *entente* was quite within the range of possibility. I firmly believed, I said then, that if the Tonquin Expedition had not turned out as it did, if everything had gone smoothly, and if M. Ferry's brilliant ideas regarding a French Indo-Chinese Empire had met with anything like the success that he anticipated, we should undoubtedly have had a Franco-Russian alliance, and that actively engaged against ourselves. The policy of Russia, it was

[1] The Report of the Lyons Mission to Southern China urges activity. *Inter alia* it says:—"A country which last year imported 192 millions of francs' worth of cotton goods must be well worth an effort, and an annual demand for 100,000 tons of cotton thread is considered a tempting prospect for the French thread manufactory in Indo-China." But as in the Chinese Customs returns no single article of French textile is mentioned, what the Lyons delegates mean is that the British trade in these articles is to be transferred to France. The Report vividly paints the advantages for France of the political objectives, Yunnan and Szechuan, and the advantageous position in Tonquin. The French plan is to drive a wedge in between Burmah and the Upper Yangtze, just as they tried in Burmah and Siam to bar our access to China, and just as they are now attempting to do in West Africa, and, to go back a hundred years, what they attempted to do in America. It is, in fact, the secular French policy, which is as constant and as calculable as the movement of Russia.

[2] "But Englishmen who have carefully followed the course of events in the East; who have watched, year after year, the shadow of the Russian eclipse sweeping across Persia and Central Asia until it has reached the frontiers of India and Afghanistan; and who now see France reviving her old ambition of an Eastern Empire and fanning in every direction the hatred and jealousy of England among her ignorant and passionate people, realise with sufficient distinctness that the alliance of Russia and France is directed as much against England and her Eastern Empire as against the Powers of the Triple Alliance." . . . . "The supremacy of Britain in Southern Asia in which are bound up the freedom of the Mediterranean, our predominance in Egypt, and the maintenance of the Suez Canal route to India." ("England and France in Asia," *Nineteenth Century*, November, 1893, by Sir Lepel Griffin.) Had the policy sketched in this paper been followed, there would have been no war between China and Japan, and we, instead of Russia, should to-day be controlling China.

evident, was to place herself in an advantageous position alongside the two most populous countries in the world, the two richest Empires of Asia, for the purpose, not of "attacking" those Empires by rough military methods, but of being able at any convenient time to exercise influence and pressure, if necessary by menace and coercion, and by such means gain what she wanted elsewhere. If the basis of Russian policy be kept clearly in mind, it will be readily understood that the positions she desires elsewhere are to be found—to quote what I said in 1886—"not on the Indian littoral, or on the coast of China itself, but in the extreme west and extreme east—in the neighbourhood of Asia Minor and the Levant, in the Persian Gulf, and in the Sea of Japan and the China Sea." The attention of our statesmen, military authorities, and politicians, who take an interest in national defence, has been concentrated entirely on the North-West frontier of India. But have we no other Indian frontier? It was obvious that whenever Russia should choose to take another opportunity again to move forward, she would do so in the China or Japan seas, and always in alliance with France. Since then Russia has practically obtained Corea and Manchuria with an immense sea-board, and not one but several "ice-free" ports. More than that: she to all intents and purposes dominates China at and from Peking.[1] There is no disguising that fact. Those who have followed the history of the conquests of China, notably under the Manchu dynasty, will not need to be told that the domination of China by Russia at and from Peking would seriously affect our future position in India, and might even create a grave danger.[2] How much more now that we have France added? We should never lose sight of the fact that India is a conquered country, where discontent smoulders, and may be easily fanned into conflagration by the neighbourhood of rival European Powers, as Sir Henry Rawlinson said years ago. If England has any vulnerable heel it is in the East, and, as Sir Henry asserted, the stronger the position of Russia in Asia "the higher will be the tone she can command in discussing with us any question of European policy." The fact is the people of this country have been ignorant and indifferent to the whole history of this Far Eastern movement. The region is remote; the points at issue complicated; our interests are not realised, and it is not only the business of no one to preach the truth, but it is the business of many to conceal it. When we consider, however, not only that in that region we have a great and increasing commerce with China and the whole Far East, but that growth of trade is an absolute necessity for this country, with its rapidly increasing population, with foreign competition growing fiercer every

[1] For a concise description of the situation in China in April, 1897, see a letter recently quoted publicly by the Hon. T. H. Whitehead, of Hong-Kong (Appendix A).

[2] The military value of China has been ably treated by Colonel Mark Bell (*Asiatic Quarterly Review*, April, 1895), who has had exceptional opportunities for studying the question from personal observation. He reconciles the apparent inconsistencies of the Chinese. The conclusion arrived at is that China furnishes excellent military material if shaped and guided by foreigners. I entirely concur with his views on this subject.

day and hostile markets closed against us, the value and importance of commanding strategical positions in the China Sea with immense hinterlands will become more and more evident to us. It is in China alone that we can look in the future not merely for any great expansion of our commerce,[1] but for any considerable strengthening of our general position in Asia. And we are now in such a position that retreat or inaction will be fatal. For Russia's coming down and occupying strategical positions, thus throwing a lasso round the throats of China and Japan, is a standing menace to our enormous and rapidly growing interests in those regions. It may mean the utilisation of China as an industrial force to be equipped and used for our destruction. And the possibility of having those masses wielded against us, setting aside altogether the mere military aspect, is serious enough to rouse us from our lethargy. Once in possession of the long-coveted seaboard with its "ice-free" ports, and of Manchuria (the territory required for her railways to the Pacific) the immediate incentive to a forward policy on the part of Russia will be removed, we are constantly assured, for she has no desire for war. But it is not an invasion of India, or any open attack, immediate or even proximate, but the rise of an Asiatic-Russia, a rival Power, utilising the resources of China, and with ambitious allies, that we have to apprehend.

It is in no spirit of hostility that I speak thus of Russia, or any other Power; far from that, rather in a spirit of admiration. They are justified in pushing their interests in their own way. What I wish to emphasise is that in place of being supine we should be doing the same in our way. Years ago I admitted the justice of Russia's wish for an ice-free port, but I also pointed out the dangers to ourselves involved in it.

The importance of promoting intercourse between the two most populous countries in the world, India and China, so widely different in their circumstances, and yet having so many and such vital interests in common, should require no argument. China knows that the policy of England, whatever it may have been, is now one of commercial expansion and development only, untainted by any ulterior designs, and as China is compelled by circumstances to take a new departure in the direction of industrial and defensive enterprise, she should be disposed to look to England as her most efficient guide and safest ally in this new path of progress. Better far than "disinterestedness" in international relations is an interest which is mutual, clearly avowed and understood, and such is the bond which should cement India and England with China. The unique opportunity for developing our relations with our Imperial neighbour, bound to us by geographical and other ties, has been neglected. After forty years of discussion and "consideration" by our Government at home and in India, while Russia has pushed her way across 5,000 miles of Siberia, and is now closing in

[1] How vital is its maintenance, not merely for the sake of our Empire, but for the sustenance of our people, no arguments are needed to prove. It is only in the East, and especially in the Far East, that we may still hope to keep and to create open markets for British manufactures. Every port, every town, and every village that passes into French or Russian hands is an outlet lost to Manchester, Bradford, or Bombay.—"Problems of the Far East," p. 415, by the Hon. G. N. Curzon.

on China, while the Russians have made progress which must compel the admiration of the world, we have done little; and China to-day leans on Russia—not on Great Britain, which she was for years anxious to do.[1]

To India the further opening of China offers a considerable expansion of her commerce, and possibly the better supply of labour where most needed, while to England it is a matter of national importance to increase her influence and regain the leadership in the various new enterprises—financial and industrial—which China will be obliged shortly to undertake. To promote these objects increased intercourse and mutual acquaintance are necessary. Experience in China, as elsewhere, has taught us that the chief obstacle to commerce and to international relations, in fact to progress generally, is ignorance of the country and its conditions, and the growth of trade which has followed the treaties of 1858-60 has been mainly due to the opening of the interior by communications and the better acquaintance thus brought about. To China a closer relationship with India (and therefore England) would be a considerable aid towards the internal development of the Empire. It would also be a pledge of tranquillity throughout the Far East. If these general views are sound, it should have been the policy of the Indian and Imperial Governments, and of all the neighbouring Colonial Governments, to avail themselves of every opportunity of improving their communications with the vast Empire of China, and by all natural, silent, and unobtrusive means to draw closer the bonds of intimacy, and thus establish intercourse on solid and immovable grounds. Yet how little has been accomplished in this direction; how little attempted![2]

Our possessions furnish us with most admirable bases for commercial expansion in Asia, such as are not now and never can be in the power of any other nation, unless our supremacy be wrested from us. We maintain along the avenues of our Eastern trade, as *points d'appui*, the Suez Canal, India, Ceylon, Singapore, and Hong-Kong. It cannot be gainsaid that upon the political supremacy of England in the East, upon the possession and defence of India and our Eastern possessions, chiefly depends the power to expand our home and inter-colonial trade, depends the continuance of our commercial prosperity, and, as a *sequitur*, the ability to support the dense and rapidly-increasing population of England. To actually part with any of these English possessions there is now no longer any desire, and there is less indifference to their value than there was. But the country has yet fully to realise what is at stake,

[1] See Appendix A.

[2] "Let Great Britain, then, take the lead, as she has hitherto always fearlessly done. Let her persevere in the task of educating China, and not, as if unfitted for it, resign it to others. China is one of our Imperial neighbours, bound to us by ties of commerce and geographical position; we cannot neglect her without injury to our Imperial interests. The decay of empire can ever be traced to a failure to correspond with its environments, that is, to actively sympathise with its neighbours, and we decline to acknowledge that the Empire is declining. The latent wealth of China is undoubted. She is of greater value than many Indias; her peoples are peaceful, tractable and easily ruled."—Colonel Mark Bell, V.C., C.B., *Asiatic Quarterly Review*, April, 1895.

how strong our position is if we choose to use it, and that to shirk our duty would mean our being insidiously ousted by rivals, who are not at all averse to undertake the necessary responsibilities, from the greatest market we possess and from a pivotal position of the world. We are at the parting of the ways, and if we do not take the right one it will mean the loss of the commercial supremacy of England, and eventually the disintegration of the Empire.[1]

Ever since November 16th, 1896 (when the German Government, through its Foreign Secretary,[2] was compelled in self-defence to "give away" the trend of its future policy), it has been apparent that there was an increasing inclination towards a working understanding both in the Near and Far East between Germany and Russia, and naturally also France (Russia's ally), for lovers in the red heat of a *liaison* are not to be separated. This *entente* was based upon mutual interests, the corner-stone of the edifice being Russia, whose favour has been cultivated at all costs by France, in a minor degree by Germany, and latterly even by Austria-Hungary. There was then "room for all," not only for those interested materially, but those who might later be useful politically; always "room"—except for England.

In the Far East, especially in China, England has been completely isolated, and while her efforts to achieve anything valuable have been rendered futile by a systematic process of thwarting practised as a fine art by Russia and France, these two countries, and now also Germany, have been securing for themselves solid advantages. Japan has been watching silently, preparing for eventualities. Official optimists put the best complexion they can on the "concessions" to England—the "rectification of the Burmo-China frontier" and the very incomplete "opening" of the water-way of the West River—whose effective value measures up poorly, however, in comparison with what other Powers have got, or are getting, in spite of the commanding position so long occupied by us. We have done little, or nothing to establish overland railway communication from Burma to China—to get on the "inside track," to reach China "from behind," as Lord Salisbury called it—and the Upper Yangtze, the main artery of China, remains practically unopened.

To understand the present situation, the natural sequel to 1895, it is first of all necessary to recognise the fact that Russia is actually the protector of China, and that France supports her solidly, while Germany, having taken the decisive step of placing herself along-

[1] A series of luminous articles, marking the stages of the Russian advance and the evolution of the Far Eastern question generally, will be found in *Blackwood*, from 1893 onwards, from the pen of Mr. Alexander Michie, a writer of the highest authority.

[2] Baron Marschall von Bieberstein, in the Reichstag—a remarkable statement. This affirmation of an understanding, based on common interests, between Germany and Russia in the Far East, was treated with contempt in this country. Yet it contained the master-key to recent events. The extra-continental interests of the two Powers "will in all probability furnish us an opportunity of acting in harmony with the Power with which we co-operated last year," Baron Marschall told the world. The occasion was one when the truth had to be revealed, and the declaration should have been noted, and acted on.

side Russia, is almost bound to follow the Russian lead, for two sufficient reasons: for fear of displeasing Russia, the close ally of France, and because nothing is to be got in China by Germany, or anyone else, in direct opposition to Russia. Russian influence has for some time past been all-powerful at Peking, mainly through the timely assistance rendered to China in 1895, followed up by a persistent policy, cemented by an understanding, offensive and defensive, presumably directed against Japan. The fundamental fact of a close understanding between Russia and China has been patent to all the world except ourselves for some time. The chief points were:—1. An alliance, offensive and defensive. 2. Branch railways through Manchuria. 3. The refortification of Port Arthur and Talienwan, and the fortification of Kiao Chau, all to be paid for by China—any or all of the three war harbours to be placed at the disposal of Russia whenever required. China has denied everything, of course, save the northern Manchurian railways, but Russia has never denied anything except, and that very vaguely, the accuracy of the so-called "Cassini" convention as published by a Shanghai paper. But, apart from any written contract, "facts speak for themselves," as M. Hanotaux said of the Franco-Russian alliance. If Russia had a claim on Kiao Chau, does it not follow that Germany can only be now acting with the approval of Russia? And what is there to prevent Germany some day from finding that Kiao Chau does not "meet her requirements," and that she wants another port; and in that case what should prevent Russia stepping in? Provision has, in fact, been made enabling Germany to treat Kiao Chau as a negotiable bill of exchange.

That Russia has been exceptionally active at Peking during the past few years has been evident to those who chose to see. Our *rôle* has been that of the little-concerned spectator. In view of what was occurring it required some nerve to vaunt our two concessions, the "rectification" of the Burmo-Chinese frontier and the "opening" of the West River, which only opened one-fifth of the river and stopped short at Wu Chau, instead of including the river to its navigation limit, with right of railway to Yunnan. And while we make so much of our concessions there are many ready to minimise the significance of Russia's being at Port Arthur and Talienwan.[1] Her presence there, we are told, merely means that

[1] Describing what he terms the "contingent interest" in Corea, Mr. Curzon says:—"A country so well provided with harbours, which could both supply and shelter large flotillas, and so richly endowed with many potential sources of wealth, might involve a serious menace to British commerce and interests throughout the China seas, and even in the Pacific Ocean, if held by a hostile State. A Russian port and fleet, for instance, in the Gulf of Pechili, would, in time of war, constitute as formidable a danger to British shipping on the Yellow Sea as they would to the metropolitan province and the capital of China. Permanent Russian squadrons at Port Lazareff and Fusan would convert her into the greatest naval Power in the Pacific. The balance of power in the Far East would be seriously jeopardised, if not absolutely overturned, by such a development; and England is prohibited alike by her Imperial objects and her commercial needs from lending her sanction to any such issue."—"Problems of the Far East," 2nd edn., p. 213. If this be true of Corea, of Lazareff, and Fusan, what about Port Arthur and Talienwan, and an immense seaboard passing into the hands of Russia?

the Russian fleet has received permission to anchor there, quite a usual thing elsewhere, and it is said that Russia will retire in the spring, which she may do—for reasons of her own. But that she is at home there, that she means to "utilise" not only Port Arthur but Talienwan, and to "dominate" China at Peking (as Madame Novikoff has been good enough to tell us), who can doubt? The fact is that our diplomacy as against Russia has been a failure in Asia.[1] *Britain is powerless to arrest Russia in Asia by means of her existing diplomacy.* The whole history of the Russian advance teaches us that lesson. What is wanted on our side is a plan, backed by force—and a man. In the one field where we have been successful (Egypt) we had our plan, 12,000 bayonets—and the man. In China we have never had the three, seldom even the man. How few are our Cromers, our Nicholsons, our Sandemans! It is not that we cannot produce them—no country in the world has them in such profusion—but that our system, or rather our want of system, does not tolerate, far less encourages them. The diplomatist, the frontier officer, is ever afraid of being disavowed, has always to think of the "question in the House." A positive plan is hard to conceive, and harder still to carry out. For this reason our Governments fall back on negotiation, which, as Popowski, a luminous writer on this question, has shown, "has the appearance of doing the utmost to check the Russians and at the same time appeases popular opinion. For these several reasons no party, no group of talented persons, enters a sufficiently vigorous protest against these futile negotiations." Russia's policy both in Europe and Asia is active, restless, whilst England would be only too glad to secure the maintenance of the *status quo*. "The English would even submit quietly to Russia's forward movement," says Popowski, "were its pace less rapid, as in that case the fight for India would in all probability be forced on a later generation. From this state of things Russia reaps great benefit. She holds the initiative, and can suit her action to circumstances; and should she now and again, swayed by public opinion or the temperament of her statesmen, be induced to advance somewhat too boldly, she can, as in 1878, purchase peace by surrendering a portion of her acquisitions. Russia will, therefore, doubtless attain her ultimate object if the Powers concerned be not convinced of the need for energetic resistance." No British policy in the Far East can be successful unless it forms part of a world-policy, and unless we are able to apply to the centre of gravity of a European combination force enough to upset its balance. Our diplomacy must be supported by force.

Unless backed by Britain, Japan must perforce wait for the completion of the large number of ironclads and sea armament now being built for her in Europe and America ere she dare entertain the idea of opposing Russia, still more Russia and her friends, with the resources of China, protected by Russia, always behind. Without a definite alliance (which she is convinced will not be forthcoming, notwithstanding the mischievously sympathetic language used in certain quarters), Japan can

[1] See Appendices A and B.

do nothing, and will trust to Britain to take steps to maintain the balance of power, much as Britain seems inclined to depend on Japan to perform the same useful office.[1] To lean on Japan, as many in this country seem inclined to do, would be a delusion and a snare. No one who has thought out the subject would entertain the idea of tying ourselves to Japan.[2] *We have only ourselves to depend on.*

And here a word about alliances generally. Within a few months we have been counselled to come to an understanding with Russia, with France, with Japan, with Germany, one after the other. We seem to treat the question of alliances as until lately we did our Navy, as a matter which could always be dealt with when an emergency arose. Are alliances extemporised on the instant? No, they are not fruits to pluck at will; they are of extremely slow growth. And while it might suit us to arrange with the Russians, what have they to gain? Our difficulty is their opportunity. If we are serious, we must remodel our institutions, on the basis that the foreign policy of a country must be judged from the naval and military standpoints, as well as the commercial and diplomatic. They are essential to each other. Yet, we not only have no supreme co-ordination, as others have; but we treat them as if they were quite unrelated to each other.[3]

The position of Russia with regard to China seems not yet to be realised. *Russia thoroughly understands how to deal with an Asiatic Power, and makes herself feared.* Seeing clearly that China is unable to perform the elementary functions of society, that Peking was another Teheran or Constantinople, that while the people were sound the Court and officialdom were corrupt, she has studied and gained over influential people and applied the maxim *Divide et impera* with skill. What China is taught night and day is that Russia is a land power and therefore alone can protect China, that she keeps her promises and threats, that with England it is always a case of *vox et præterea nihil.* In short, Russia protects China in a peculiar sense—that is for a price, to be paid to Russia, or even to her friends, a fact which clearly shows how powerless is

[1] As far back as December 10th I wrote to the *Times*:—"If we do not repent (the neglect of our interests in China, etc.) and boldly re-cast our policy we shall be squeezed bit by bit out of China, and the only Power locally interested as yet not against us—Japan—will in that case be inevitably forced to come to terms with Russia, a process which an Asiatic Power is never slow to follow."

[2] See the masterly articles, by Mr. Frederick Greenwood, in the *Nineteent Century* and elsewhere, notably one in the *Nineteenth Century* for February, 1898.

[3] It is even much more important for Great Britain than for the other great Powers that public opinion should be accurately informed on those subjects which are so closely connected with foreign policy, inasmuch as with most Continental States the settlement of a foreign policy falls within the province of the monarch, whereas in Great Britain a policy can only be pursued when public opinion has been enlisted in its favour. Moreover, Continental Governments are much better informed on military matters than the British Government, in which even the Secretary of State for War is not a military man, and at the head of which a Queen presides. We believe, then, that we are in nowise injuring British interests in discussing the Anglo-Russian strategical relations, especially as the Russian staff has doubtless already minutely studied the question.—"The Rival Powers in Asia," Josef Popowski, p. 157.

the Chinese Government and how powerful that of the Tsar. The dominating idea of the Chinese Court and officialdom, which, *in the absence of a strong policy on our part*, are in a hypnotised condition, is to be saved from Japan. The great object of Russian policy is to utilise China for the territorial expansion of Russia, an immediate cause of anxiety being Japan. The Russian system, for which the Chinese are ready to pay, is by moral suasion to "influence," not to "conquer," China; to "utilise," not to "annex"—a slow but insidious and sure process.

In view, then, of the enormous amount of work yet to be accomplished in the settlement of her vast territories, simultaneous with the laying down of the network of railway communications—not to speak of Mongolia and the extreme portion of Northern China (of which Peking is the centre), to be dealt with later—the Russians were not indisposed to see a powerful, accommodating, and safe neighbour and friend in Europe established in the Shantung peninsula, conterminous with Russia, and committed, as they hoped, to support the Russian position against anyone who might be likely to assail it. The attempt made to make the Russian occupation of Port Arthur appear a "counter-stroke" was ridiculous. But credulous Englishmen seem to be plentiful. It is apparent, one would imagine, that it suits Russia to have such a view adopted in order to placate France, who is suspicious, and to soothe the susceptibilities of Britain. Russia, expert in putting a "face" on things, has actually succeeded in placing China completely at her ease while occupying her territories and war ports, and not even objecting to Germany doing so also; and for us to be taken in by these pretences would be to confess ourselves as childish as the Chinese. We shall next be told that if France moves, a further "counter-stroke" is necessary. The combination now at work in China takes the form, then, of a three-cornered pact (China, Russia, and France), the latter somewhat fidgety doubtless, to which Germany feels bound to subscribe. The French "sphere"—the South, with Yunnan and Szechuan as objectives—is not adversely affected, for none of the "spheres" of Russia, Germany, and France clash.[1] And in this connection the difference of Russia's attitude towards our suggested opening of Talienwan as a treaty port and Germany's occupation of Kiao Chau and its hinterland is only too significant. The time for the late *coups*—the occupation of Kiao Chau and Port Arthur—was certainly well chosen, for neither Britain nor Japan was ready to oppose. The former was pre-occupied in various parts of Africa and on the north-west frontier of India; the latter seriously embarrassed financially and with her armament, which she is straining every nerve to complete, still unfinished. The incident serves to show that our rivals diagnosed the situation with remarkable acuteness. *They* were not caught napping. They had their plan and the machinery for carrying it out.

Presumably to inculcate philosophical resignation, we hear a good deal about the "favoured nation" formula being applied in China. Every fresh port is to be regarded as a "Treaty Port," etc. But is

[1] See Herr von Bülow's speech on February 7th.

the doctrine applicable in cases like Kiao Chau, or Port Arthur? Can we claim equal rights at the former, with its "lease" and sovereign rights granted to Germany, or at the latter, with railway and mining rights and hinterlands in both cases under practically military control? Of course we cannot. It is a *reductio ad absurdum*. Germany already has troops operating in the interior. It is said, too, that the value of Kiao Chau is commercially not great, and of Port Arthur nil, and that they do not affect our trade. This is quite a delusion, for, with hinterlands full of resources, and with a splendid race of men, such as both possess, in the hands of pushing protectionist Powers, the result is clear. Have we lost all sense of perspective or the possibility of growth? Have we forgotten the beginnings of Hong-Kong, of Rangoon, of Singapore; how the sceptics, the narrow-viewed, saw in these places no future whatever, and actually urged their abandonment? An argument used to demonstrate how little can be done from Kiao Chau with the hinterland, is that Hong-Kong has made so little impression on the interior. But the cases are absolutely different. We were, and still are, merely on an island, on the outer fringe, with no hinterland which we meant, by hook or by crook, to develop—a vast difference. With roads, railways, and mines systematically worked, with the back country, in fact, opened up, we shall soon have an object-lesson as to the potential value of at least one part of China. As to the value of Manchuria and Shantung, I never met one Russian, and few of any other nationality, who entertained any doubts on the subject; and if the insular Englishman cannot realise its value, let us ask the opinion of some British Columbians, men of our own race, inhabiting a similar country. Plenty of people thought British Columbia also "worthless." There are those who say the German occupation of a mere port or coaling station is of no consequence to trading nations, as if Germany meant for ever to confine herself to that one spot. They forget that if Kiao Chau was created out of nothing, surely a province may more easily be created out of such a pregnant nucleus as Kiao Chau. The breaking-down of the fence is the important thing; that done, extension of dominion follows naturally.[1]

Recent events in China have, at least, done Britain one service: they have in some degree dispelled the mists which obscured the real

[1] "When one considers how much energy is being displayed in mapping out and apportioning the waste places of the earth, and how much heat is occasionally evolved over some trifling piece of hinterland of no great value to anyone, one wonders that the Far East claims so little of public attention in this country. For there we have not only enormous tracts of territory as yet almost undeveloped, as for instance great parts of Manchuria, Mongolia, and northern Corea, all white man's land and all capable of bearing rich harvests, but the whole of China proper is as yet unexploited by the engineer and the railway contractor. China is about the only part of the world where the engineer has not set foot, and yet there is no part of the world where his services are more needed or would be better rewarded. . . . These facts are, I think, much more clearly perceived on the continent of Europe, and it is not surprising that there should be an eagerness displayed among our commercial rivals to be the first in the field for the privilege of introducing into China the modern improvements of steam and electricity."—Mr. Consul-General Jamieson, Address to London Chamber of Commerce, October, 1897.

China from our vision. If we have not yet made up our mind as to the policy that ought to be pursued, we begin at least to know what our interests are. It is now universally recognised that our interests are commercial, and not territorial, and that all we claim—"but do claim," as Mr. Balfour asserted with emphasis—is equal participation; in plain language, we mean not to be excluded. We have at last got a clear definition of the "room for all" doctrine. Admirable in the abstract, it remains an empty formula unless practically applied. This is what the country has to see done, leaving the Government to devise the special machinery for its accomplishment. Not to mention Madagascar and Tunis, Siam furnishes an object-lesson apposite to this China question, as regards the defence of our interests. There 87 per cent. of the shipping and $\frac{1}{13}$ths of the imports and exports are British. France had recently one steamer running between Saigon and Bangkok. But our predominant interests did not ensure their defence, nor did forbearance secure immunity from attack. In Siam we had a simple problem, only France to face. In China we have a very different and infinitely more difficult question to deal with. And here a word of warning is necessary. Not for the first time is it that something like a true perception of British interests has been reached, only to be followed by a relapse into the previous apathy. What has been and is still wanting is a vigorous and sustained pursuit and defence of those interests. It is because she has been neglected by Britain that China has yielded to the sustained pressure of Russia, just as Persia has done. We have long had treaties which would have enabled us to safeguard our interests, but we have failed to give them practical effect. The mercantile community in China, when asked what fresh measures or treaties would meet their wants, have again and again expressed the opinion that all they desired was to see what they already had (*i.e.*, the treaties) put into force.

The doctrine of "equal trade" is admirable from our point of view. But how about its application? If meaning anything, it involves our refusal to permit any foreign Power to acquire further territory unless it adopts equal trade in such territory, even at the cost of war. Foreign Powers see this and will negotiate and temporise with us. They will promise, and they will respect their assurances just as long as it suits them—no longer. They understand that at present their distant possessions are held at our pleasure; but ten years hence, even sooner, Russia at least will be independent of our sea power.

We may well ask what is meant by declining to recognise that "spheres of influence" are already in operation which "establish exclusive commercial control." We have had recently several important statements on this subject from France and Germany, and the more significant silence of Russia.[1] Besides these, facts speak for themselves, as M. Hanotaux says. Clearly this reliance on our *theoretical* treaty rights is completely illusory. It simply gives the Russian domination

[1] We have the statement of Herr von Bülow, "the spheres do not clash," the significant reference of M. Decrais to Nanning and Talienwan, and the utterance of M. Hanotaux as to the reservation of Southern China for French exploitation.

of China time to take root, for since we so ostentatiously rely on verbal security they are adroit enough to avoid using the set form of words which might alarm us. They need not openly advance pretensions or formulate claims, yet may they possess the substance while we please ourselves with the shadow. No sphere of influence "which stops short of actual annexation" could give the right to establish exclusive commercial control, we are told. But the Russian "utilisation" not merely of Manchuria and Corea, but of Northern China, will continue until the Tsar converts his present indefinite into a specific domination of China *at and from Peking*.

Appetite grows with the eating, and the one "ice-free port" which might have satisfied Russia a year or two ago will not satisfy her now, and she wants all the ports, in fact everything in Northern China and Corea. The control of the sea-borne Customs seems to be the alpha and omega of our policy, judging from what appears in our Press. But is trade not generated on land? And is not Russia in actual or potential possession of the land? The sea is merely the road, on which nothing grows.

In view, then, of the present position—the constant onward movement of Russia in the North, and of France in a minor degree in the South, and now also of Germany established on the mainland between the two and flanking the Russian position, the first and last with hinterlands of great value, with a Russian system of railways being pushed forward with feverish haste (the Siberian Railway[1] to be completed in four years and the Manchurian Railways[2] in six); with Russian influence all-powerful at Peking, and dominating her working partner, practically a hostage to Russia, what is to be done? After all, that is the crux of the whole problem. Before indicating the class of measures which should be adopted, it is necessary to reconsider our world-policy with regard to markets, and come to some decision on the subject.

Some dozen years ago it became apparent that various causes were beginning to operate which should have led the commercial community to consider its position carefully. Among these were the activity of our Continental rivals in competing not only in manufactures but in the carrying trade and distribution abroad; this while hostile tariffs were enacted against our goods. A hunger for new outlets resulted in a scramble for colonies, where tariffs unfavourable to Britain have been, and are being, enforced. The industrial States of Europe, as was anticipated, have relatively developed their foreign trade and mercantile

[1] The Siberian Railway is now open to Kansk, the distances being as follows:—

Moscow—Tcheliabinsk	2058	versts.
Tcheliabinsk—Krasnoiarsk	2037	,,
Krasnoiarsk—Kansk	228	,,
Total	4323	,,

The line will be open to Irkutsk this autumn.

[2] See the remarkable description of the Trans-Manchurian Railway, by the special correspondent of the *Times*, in issue of March 7th.

marine more rapidly than this country has done. The fact that there are two classes of markets, (1) immediate markets, such as China, ready to be utilised; and (2) markets of the future, such as Africa, which require cultivation, have to be created, seems to require no demonstration. In conditions such as are sketched above, Britain has neglected for years the finest market still open to her in the whole world, while expending her energies in search of possible markets in Equatorial Africa.[1] A strange preference it appears to me to-day, as it seemed twelve years ago, when I wrote:—"Compare these Asian markets, China and Indo-China, with Africa. In Africa you have a population of savages, slothful and degraded, poor and unclad; in China and Indo-China educated races, whose civilisation dates back far before that of Europe, races for the most part energetic, sober, hardy, clothes-wearing, tool-using, trade-loving, industrious; many of them possessed of a considerable degree of affluence. In vegetable and mineral wealth these lands are unsurpassed."

Has not this mania diverted us for some years past from our true interests into an attempt to build up an African Equatorial Empire, an attempt which can lead to nothing save disaster? Let anyone take up a world atlas and ponder the problems we are now confronted with in India, and then consider that the destiny of a market of three hundred and fifty millions hangs in the balance. Then let him decide whether our world policy is a wise one or not. Are there not Ugandas and Nyassas and "breezy uplands," of which we hear so much on the deadly West and East African coasts, already in our possession in India, and even in the West Indies, without expending our national energies on their acquisition in Central Negroland? South Africa, including the greater part of Mashonaland and Matabeleland, must of course be excepted as a white man's country, the Niger as a trading field, and North Africa, for political and economic reasons; but with these exceptions the rest of Africa is unfit for the white man. Its most sanguine advocates hope only to create another, an inferior India, minus the population and the civilisation. Yet Britain thinks it good business to make railways to Uganda, while she has actually not seen her way to connect India and China, the two most populous Empires in the world.

It is useless for the country to talk of safe-guarding our interests in the Far East if we are bent on Empire-making in Central Africa. We have to choose between them. Our enterprises in Central Africa are mainly territorial, the very elements of commerce in such a savage country being necessarily non-existent. So long as our resources, moral and material, are drained off to found an Equatorial African Empire, so long, in my opinion, will our substantial interests all over the world, but more especially in the Far East, be neglected. Presuming, however, as an absolute preliminary to effective action in China, that the country seriously means to devote to its interests in China a fair proportion of its attention, we have two agencies ready for use at our command—Financial Resources and Sea Power. In certain critical situations—and

[1] See Mr. Consul-General Jamieson's opinion quoted elsewhere.

the present is one—we possess the power to assist China and to lay down conditions, and the opportunity should be taken advantage of. We must see, however, that we do not expend our resources merely to secure another creditor. To rely on diplomacy alone, without using the one agency and being ready to use the other, will be futile. If our diplomacy has failed in the past, is it likely to alter for the better unless we make up our minds as to what we mean to strive for, and how we are going to get it? The old days of monopoly, when we "stumbled into success," are gone for ever, and we have entered upon an era of competition, fierce competition. The pursuit of trade and Empire will not relax, it will increase, and we must re-adjust our old machinery, employing the methods of modern education, modern discipline, and modern government.[1] Russian influence at Peking is due, as I have already stated, to the political assistance rendered to China in 1895, and to the financial aid given later, followed by a persistent policy on the part of the Russians, who claim to understand China, which they really do. The line of conduct to be pursued is clear. We must take a lesson from Russia. Our policy is to strengthen our position and influence at Peking with a view to keep open a market of three hundred and fifty millions ready for development, and towards that end induce China, by pressure if necessary, to adopt reforms which would be of advantage to all the world, including herself. The position is difficult, but it has to be faced.

Foremost among these reforms I would place opening the country by means of communications, railways, and waterways, for they are the necessary preliminaries to all other reforms, of which it is useless to talk until efficient communications exist. These established reforms will follow as a natural consequence. That China has no insuperable objection to giving way on this question of communications is made clear by the concessions she has already made to Russia for an immense network of railways within Chinese territory, the granting of similar railway rights even to France in the South, the arrangements which were nearly carried out last year with a so-called "Belgian" syndicate for trunk lines throughout the Empire, and more recently the railway and mining concessions, of vast importance, to Germany. The Chinese have attempted to carry out railway schemes without foreign control and by means of

[1] "England is but the centre of a world empire, and our interests are rather Asiatic than European. We have to a certain extent acknowledged this by endeavouring of late years to keep clear of compromising engagements in Europe; but we have not yet taken steps to assert our position as the leading Power in Asia, able and determined to maintain peace throughout the East, and to keep all markets open, without fear and favour, to freedom of trade. This can only be done effectively by so re-organising our administration and diplomatic arrangements as to ensure that every part of the Eastern world shall receive its due share of attention from a department specially instructed and informed, and that our most vital interests shall not be left, as at present, to take their chance of consideration in the rare moments of leisure which the Foreign and Colonial Offices can snatch from the conflicting claims of Europe, Africa, and America."—"England and France in Asia," *Nineteenth Century*, Nov., 1893, by Sir Lepel Griffin.

Chinese capital, and have failed completely. Now is the time to press on their Government a comprehensive policy of opening the country. In pressing such measures we should be on solid ground, more especially if what we urged was not exclusive, but for the evident security of China and the prosperity of her foreign trade. The Chinese are on their part not unwilling to have a countér-balance pressed on them.

The interest of our Colonies in this question seems to have been largely overlooked. Should the mother country not recognise her duty, it may be safely predicted that Australians and Canadians will most bitterly resent the neglect of their obvious interests. Through Canada lies the All-British route to the Far East.[1] The natural destiny of Australasia is to dominate the Pacific, and our Colonial kinsmen rightly look to us to see that the vast trading regions of China and Japan are kept open. Every acre "utilised" though not "annexed," every hamlet brought under Protectionist influence, is so much closed to the British Empire.

Before concluding, I would beg leave to say that the views I have ventured to bring before you are no sudden inspiration derived from recent events, but are the matured result of a life study, of experience gained in many and different regions, of earnest observation in the Far East, in Africa, in the United States and Canada, and, finally, of a recent and most interesting residence of six months in the Chinese capital, under circumstances which afforded me a special insight into the diplomatic situation there. The effect of repeated visits to the Far East has been to cause China to bulk larger and larger to the mental vision as the great market of the future, as a region with which the destinies of the English people are involved in a degree to which our Indian Empire alone offers a parallel. And such being my strong conviction, I would submit to my countrymen in all seriousness whether they do not consider the political and industrial development of that vast region, China, as an object worthy of their highest and most sustained effort, whether they do not consider it a commercial heritage worth defending, and whether, for the sake of their children and those who have to come after them, the prize be not one which is even worthy of considerable present sacrifice.

To sum up:—

1. The centre of gravity of world-trade and world-power is shifting from West to East. Russia is becoming more and more an Asiatic Power. She will, nay must, continue to advance her frontiers and extend her influence over China and Corea, until she meets with a barrier which she can neither remove nor overstep.

   Our existing interests in China are very large, more than 70 per cent. of China's trade, over £32,000,000,

[1] In view of the European competition with ourselves in China and Japan our All-British service for mails, passengers and samples *vid* Canada should be boldly developed. The route is a great circle in temperate regions, a short Atlantic link, a fast train link, and a ten days' Pacific voyage. A weekly and "first-class" service would be a powerful aid to our supremacy in the Far East.

while our whole Far Eastern trade is £130,000,000, and this constitutes a present interest worthy of the greatest sacrifices to defend, while it contains the elements of indefinite expansion.

2. Russian ascendency, unless effectively contested, means the gradual but complete transformation of China, industrially, politically, and otherwise, which would constitute a grave danger for Great Britain, and would eventually compromise our position in India.

3. Our diplomacy having proved powerless to arrest the Russian advance, the only means open to us is to use some of Russia's methods, to push our interests as she does, to occupy the ground with our enterprises, and effectively to defend our industry and commerce at all points.

4. We cannot do much in Central Asia or in Persia, but China affords at once a base and an objective, and is, in fact, the only region where we can introduce any effective counterbalance.

APPENDIX A.

"Russian activity is increasing in the north of China. There is no use disguising the fact that the ascendency of Russia is the most powerful factor in the present situation in Peking. All concessions in the north demanded by the agents of other nationalities are checked by Russia. Mining schemes to develop the immense mineral resources of Chili and Kirin received by the Tsung-li-Yamen from important English syndicates are considered, are even assented to, and then, in deference to a hint that such concessions are in territory to the north of Peking, which must be regarded as within the 'sphere of influence' of Russia, are ultimately shelved. Even the negotiations for the new loan are tentative . . . Activity is shown in many directions. A military attaché, an engineer officer, has been stationed in Chefoo within easy distance of Kiao Chau Bay, the reputed stronghold of the future Chinese Navy, and the harbour which under certain eventualities may, if reliance can be placed on the terms of the Cassini Convention, be 'leased' to Russia. Another military *attaché* from the staff of the Governor-General of Eastern Siberia is in Peking, a third in Tientsin. Experts in many departments—war, mining, and finance—are on the spot, while the staff in the service of Russia is still further strengthened in the person of Mr. von Grot, one of the ablest officers of Sir Robert Hart, who has resigned the Customs to join the directorate of the Russo-Chinese Bank. Mr. von Grot is known to enjoy the confidence, as the term is understood in China, of Li Hung Chang and other high officials in Peking, and as Chief Chinese Secretary he has had exceptional opportunities of acquiring an intimate knowledge of the inner working of the Customs Service. New premises for the Russo-Chinese Bank and the Eastern Chinese Railway are being built in Legation Street in Peking, and a new branch is

also to be opened in Newchwang, while schools for teaching Russian are already established in Tientsin, Peking, Kirin, and Mukden. In the west of China the influence of Russia is spreading apace; it has penetrated even more deeply than one cares to admit. Kashgaria and Ili are hers whenever she cares to stretch out her arm to seize them. All Chinese Turkestan must follow the Khanates of Central Asia in swelling the Asiatic dominions of the Tsar. It surely was an ominous sign for China during the recent recrudescence of Mohammedan disaffection in Kansu that the Chinese officials recognised the powerless condition of China and appealed for aid to Russia," etc., etc.

APPENDIX B.

The following observations, written nearly forty years ago, by Dr. William Lockhart, after a long residence in China, show how history repeats itself, and how little we, as a nation, have learnt. "The Russian Government anticipated us—not in the knowledge of the advantages of close commercial and political relations with an Empire so enormous in its resources, but in the employment of those arguments that alone could render a vain and effeminate State sensible of their value. . . . The map of All the Russias, published at St. Petersburg, now includes that vast portion of Central Asia heretofore the outlying Provinces of the Chinese Empire beyond the Great Wall. Having placed a Mission in the Chinese capital, and organised an overwhelming army in Chinese Tartary, with magazines of warlike resources, Russia easily secured a permanent footing in region after region, till she had dominated over, and then obtained the cession of all the intervening space, leaving the conquest of the entire Chinese Empire to the time when it should please the reigning Tsar to order his Cossacks to take possession. It is impossible to state with any precision the amount of moral or material support that the Chinese Emperor received from his Imperial brother and formidable neighbour, which encouraged him to so obstinate a resistance to the demands of England and France [in 1860]; but a slight acquaintance with Russian policy must satisfy anyone that, having established itself as a favoured nation, Russia could not regard with complacency any attempt made by another nation to share such advantages."

Sir WILLIAM DES VŒUX, G.C.M.G. (late Governor of Hong Kong):—I rise with pleasure to respond to the invitation addressed to me, although I cannot hope to add much to the very comprehensive view of the situation that has been presented by Mr. Colquhoun. I need hardly say I have been intensely interested in what he said, and speaking generally, I agree with all he said. I remember some years ago reading the account of Mr. Colquhoun's adventurous journey through Southern China into Burmah. I cannot say that my recollection of it is very accurate, as it never is of anything I have read long ago, but I can remember one general observation that I made about it, namely, that it consisted entirely of a plain account of what was seen by the eye of a highly competent observer. It entered into no long moral or polemical disquisition upon the morals, habits, or character of the people, or of their Government. It confined itself simply to the statement of what he saw, and he allowed his readers to draw their own inferences. It might have been perhaps supposed that he was unable to draw inferences for himself, but the paper he has read to us to-day has shown that he was probably better

able to do so than most of those who make such attempts. His paper is specially useful in that, as I believe, he said its principal object is to draw public attention to the enormous value of our trade with China. I have expressed my opinion on that elsewhere, and I will not enforce it further now. I quite agree with him about the comparative value of the China trade and that of tropical Africa. Some seven years ago I expressed in an article written in one of the reviews my not very high estimate of the value of tropical Africa to England. I said at that time that it was certain to cost enormously more in expenditure than we would ever get from it in either trade or any other value. My opinion on that matter has not altered, but unfortunately now we have to deal with facts as they are. We have taken possession, we have entered into obligations with the people over whom we have taken control. We owe a debt to those who have expended their energies and lost their lives in carrying out the policy which they were intended to carry out. I think it has been an unfortunate acquisition of territory myself, but we are now bound to hold to it, and that consideration complicates very largely and renders infinitely more difficult the consideration of the right policy with regard to what is immensely more important, namely, this Chinese market for our trade. The author of this paper has given us a comprehensive and suggestive survey of the situation in China, such as will be specially useful for creating discussion on the subject. I unfortunately did not have it before me until I came here this afternoon; any remarks I may make about it, therefore, are likely to be somewhat disjointed. As to France, no doubt the Government of that country would like to pose before the people as desirous of and intending to take a slice out of the cake which other countries have already cut into. I question, however, whether their ambition is not likely to be limited to the island of Hainan, that is to say, if their Government is controlled by any idea of France's true interest. When you compare the millions that they have spent on the conquest of Tonquin and Annam, countries which are even as yet scarcely subjugated—they are continually fighting there with bands that come from over the border—I am inclined to doubt whether French statesmen will care to extend their empire further, and incur larger expenditure and more responsibility. I have visited every important colony of France in the world—Cochin China, New Caledonia, Martinique, Guadaloupe. I have noted what they have cost, and I find that in every one of them far more has been spent than has been or can be obtained from them. If the French Government retains a condition of sanity, I can scarcely imagine that with their enormous expenditure and their present financial condition they will enter upon further adventures. Still it is of course possible, and we have got to bear it in mind. But I venture to say that against further intrusion on the mainland of China, England ought to put down its foot. I have expressed my opinion elsewhere about the recognition of what may be considered *faits accomplis,* but further intrusion should be resisted, and it should be made known that we intend to resist. But the difficulty in all these cases about carrying out the policy which Mr. Colquhoun indicated, of extending our railways and pushing our commerce into the distant parts of China, is that at the present moment we have not the force and influence to preserve such advantages as we get. With that view we have got to do two things in order to restore our influence in China and to obtain allies. I do not believe at the present moment that with our small Army, in view of the enormous forces that might be brought against us, it would be very easy now to take proper care of such interests as we have or may obtain. Of course we can do much with our Navy; but I am bound to say that I think England, entering alone on the defence of what Russia has already practically acquired, would, in consideration of our obligations and our difficulties all over the world, be pursuing a foolish policy. I believe it is quite possible to get allies. I believe, as I have expressed elsewhere, that there are several great Powers who are strongly interested in the same direction as ourselves. Having reached the limit of time permitted, I will say no more on this

point. Allow me, however, to thank the lecturer warmly for the attention which he has so ably drawn to a most interesting subject, and a subject which is more important to Englishmen than has even yet been sufficiently recognised. I trust that papers like this will have a great effect in promoting discussion and bringing about a decision with regard to the subject in hand. I have but one thing further to say, and that is that what we want in England with reference to this question is some definite policy, and to fearlessly carry it out; not to be continually providing after they have arisen, instead of before, for emergencies affecting our interests which ought to be foreseen as likely to arise. If it be known distinctly what we mean, we shall find plenty of friends in the world. If not, we shall be left to our own resources.

The CHAIRMAN (Sir Lepel Griffin):—I would ask Mrs. Bishop, so well known to many as Miss Bird in former days, and who is equally renowned as a traveller and writer, if she would be so kind as to say a few words on the subject of Manchuria, about which her last book has given everyone valuable information.

Mrs. BISHOP:—I must say how very cordially I agree with the views put forward by Mr. Colquhoun. As a traveller for 8½ years in Asia, and for the last 4½ years in the Far East, I have arrived independently very much at the same conclusions that Mr. Colquhoun, with his far wider and longer experience, has arrived at. At the same time, while he has been reading his valuable paper I have felt a sort of mournful feeling come over me, as if whatever we might do now would be done too late. It appears to me that we have been adopting for years past what it is almost too much of a compliment to call an "opportunist" policy in the Far East. It has been rather a policy of drift, a drift without any definite aim, which in the regions I am specially acquainted with has resulted in the partial effacement of England as a factor in the political situation. This is particularly the case in Corea, which is now absolutely drifting—or I should rather say has drifted—out of English influence. If there had been a policy in Corea at all, if any token of support had been given to British interests, for instance, if Mr. McLeavy Brown had received the C.M.G. recently bestowed on him when it was suggested to the Foreign Office in January of last year, I believe that the finances of Corea would never have passed into Russian hands. But I think Sir Lepel Griffin asked me to say a few words on Manchuria. So far as I saw it in the course of two months, I thought it one of the most beautiful and most magnificent regions of the Asiatic world; with a soil deep and stoneless, naturally irrigated, capable of bearing four crops in the year in its southern and central portions, with abounding waterways, roads practicable for five months in the year, a hardy and industrious population, a climate allowing of the growth of almost all things that are valuable for food—with timber, coal, iron, and other mineral riches in abundance, and with a population which would not concern itself very much about any particular mode of Government so that it was left alone, which would accept Russian rule, I have no doubt, as not an altogether unwelcome change from the inequalities of Chinese rule, as I have seen native races accept Russian rule elsewhere as a relief from the oppression of their native princes. I think this would be especially the case in Manchuria, and that if there were any opposition to Russian absorption it would only come from the Manchus, the Tartars, whose interests are bound up with the reigning dynasty, and who, therefore, might give it a sort of lingering adhesion; but on the whole I should say, from what I saw of the people, that Russia would gradually and easily absorb Manchuria, and in doing so would possess herself of one of the most magnificent parts of the world. It is calculated that there is a population estimated at the outside of 20 millions, but experts consider that the viceroyalty might sustain 100 millions with ease, and that, not only by agricultural pursuits, but by coal mining and mining of various kinds, for the mineral wealth of Manchuria is believed to be in many places as great as its undoubted agricultural wealth. Of course, Mukden has a special sanctity in the eyes of the Chinese as being the cradle of the ruling

dynasty; and being politically the second city in the Empire, it may be that there would be an unwillingness to allow it to pass out of Chinese hands. The only point, however, that I will emphasise from personal observation is that Manchuria is a most magnificent territory, a superb acquisition. I know it is not the fashion to speak of it in this way, but the truth is higher than fashion, and the truth is that no province in China, so far as I know the Empire, with the single exception of Szechuan, is richer, more fertile, and more capable of supporting an immense and prosperous population than the viceroyalty of Manchuria.

Mr. J. M. MACLEAN, M.P.:—I am sure we have all listened with great pleasure to the interesting personal experience of the lady who has just addressed us. I cannot offer you anything of that kind. I can only speak as one who has lived many years in the East, and who has made a careful study of Eastern affairs during the greater part of his life. I listened with intense delight to the very valuable paper which Mr. Colquhoun has read. He has lifted us into the higher region of international diplomacy, and he explained in frank and fearless language what are the principles on which alone empires can be built up and maintained. I do not quite agree with him in thinking that the people of England are either ignorant or careless of the great heritage that they possess in the East. I believe that the great difficulty of the Government at the present moment is to restrain the impatience of a people who have grown sick and weary of the persistent and organised persecution, and almost intimidation, which has been directed by other Powers against British interests in all parts of the world. Now, what is the central idea of the paper that Mr. Colquhoun has read to us? It is that the trade of the East is of supreme importance to this country. Well, the trade of the East we have enjoyed for a whole century now without any attempt on the part of anyone else to compete with us. The East has poured its riches into the lap of England during the whole of this century. Even forty years ago you might say that from Suez down to the Cape of Good Hope, and from Zanzibar to Yokohama, the whole Eastern world was our undisputed domain, and that was largely the fruit of what was done by the East India Company—a company of merchants of the greatest sagacity, who had not only the commercial instinct, but the power of taking a political initiation in public affairs. They not only conquered India, but they used India as a basis of operations from which they obtained the command of the whole trade of China and Persia, and Arabia, and the east coast of Africa. That was what they handed over to the English Government when the English Government took possession of India from them. A great change has taken place. Partly through the opening of the Suez Canal, Continental nations have been able to penetrate into seas which formerly they could never even approach, and we are threatened with competition on all hands. What is the position of our Government at the present moment? A resolution was accepted in the House of Commons the other day with the assent of the Government, saying that the maintenance of the integrity of China was one great object of English policy. That ought not to be merely a pious opinion to be expressed but not acted upon by the Government of a great country. If it is the aim of our policy, we ought to be prepared to maintain it. Yet the integrity of China is now threatened in all directions. I have heard it said to-day by a gentleman of great distinction that we are not powerful enough to stand alone and defend our interests out there. I believe there is a habit of greatly undervaluing the resources which we really possess, both on land and sea. I was putting together the other day the figures relating to our land forces, and I find that we have always on foot at the present moment armies consisting of 450,000 men, a great portion of which are constantly engaged in fighting in different parts of the world. Then we have a basis of operations in India from which we can divert land forces for service in China. We have a Navy which can not only protect our own shores, but prevent any force from any Continental country going by sea to any part of the world. I am not one of those, therefore, who despair of

seeing England protect her own if she chooses to do so. But I quite agree with the speaker I have referred to in thinking that what we want is a definite policy, and a firm resolution to uphold that policy wherever British interests are in danger. I think there has been too much talk about the disinterestedness of our policy in opening our ports to all the world. All the world are not taken in by such professions, professions which savour a good deal of what Mr. Cecil Rhodes called "unctuous rectitude" on our part. If we open our ports to the world, it is because we think it our best policy to do so. What we want is the determination to support British interests in all parts of the world against any other interests which are brought into competition with them. Of course, we have a very great commerce still out there, but our commerce in the East only depends on the belief of Asiatic nations in our superior strength as an Asiatic Power. Once we lose their confidence in that respect, once we allow any other Power to take precedence of us in the Far East, our commerce will soon be in danger, and that is the risk we run at the present moment. We cannot allow any other Power to be predominant in China and ourselves to take the second place. It is time that we roused ourselves to a knowledge of what we have to encounter there. Now is our accepted time; this is our day of salvation; and I believe, with the lecturer, that if we do not make up our minds to have a definite policy and to carry it ou , ten years hence, after we have made concession after concession to all other countries, we shall find that nothing remains for us but to repeat the fatal words "Too late."

Captain Sir JOHN COLOMB, K.C.M.G., M.P. (late R.M.A.):—I wish, Sir, in the first place, to say how much I think we are all indebted to Mr. Colquhoun for the very admirable lecture he has given as a sequel to a most interesting one he gave here a few years ago. It is extremely interesting to read these two together, as I did this morning, and one cannot help in doing so but regret that a little more attention was not paid to his words then, when perhaps the circumstances of the present moment might have been different. But I think that while we are, on the one hand, unduly alarmed at other nations putting out into the world and acquiring territory abroad, we are, on the other hand, too apt to be neglectful of more real danger. To my mind, the fact of France or Germany, or any other Power, obtaining and developing great over-sea possessions is not a matter that need alarm us, as long as we do our duty as a sea Empire and maintain an adequate Fleet. But, Sir, the case is entirely different when you come to deal with a great Power like Russia, spreading from the sea in one hemisphere to the sea in the other; and it is that fact, and the fact that to the south lie those enormous interests, the direct interests of India and the indirect interest of British trade in China, that gives to the lecture and to this question a terrific importance to every British subject. You will see it mentioned in the Press as though this was a sudden spontaneous dash of Russia, this gaining a foothold in Corea. But we know, or those who have studied the question at all know, that this is merely the result and the full fruits of the persistent efforts of 400 years. From the time of Henry VIII. down to the Crimean War the advance of the Russians was steadily towards the sea of the Pacific; but it is too often forgotten also that while we were engaged in the Baltic and more seriously engaged in the Crimea, Russia was then accomplishing quietly what she had been trying to do for some generations, to control the Eastern outlets to the sea. That is, Sir, too often forgotten. The history of that time must show us, I think, that British policy and British knowledge must never root itself upon one particular part of the world, for while we were pressing her in the Crimea and in the Baltic she bulged out on to the Pacific. I think most of us will agree with what the lecturer has said, or rather indicated, that the Eastern Question for Britain is much nearer the Yellow than the Black Sea. I entirely agree with what he and my honourable friend in front of me have said, of the necessity of having a definite policy and sticking to it; and I also agree with

them that a policy without force behind it is not of much avail. Now this question concerns British trade and concerns British citizens who trade all the Empire over. Do let us remember that, if we exclude India, no other part of the Empire provides us with any force at all. When we talk of the Empire of England meeting the Empire of Russia in any struggle, we mean the resources of these two islands and the Empire of India alone meeting the concentrated resources of the whole Russian Empire, it means nothing else. Let me just emphasise that before I sit down. Mr. Colquhoun has said in conclusion that the interests of our Colonies in this question seem to have been largely overlooked. I ask: Are the Colonies themselves not a little overlooking their own interests and their own duties in not combining with us to provide the force necessary in the maintenance of a policy which is as necessary to them as to us? The lecturer further says, "Should the mother country not recognise her duty, it may be safely predicted that Australians will most bitterly resent the neglect of their obligations." But I venture to say that they are neglecting their most obvious obligations in not preparing to combine with us with that necessary force free to be applied anywhere in the Pacific, and that the sooner they learn to do it the better. In conclusion, let me point out one other matter. You see that enormous mass of territory marked on the map "The Russian Empire." You see in the south that enormous territory marked "Australia," and also "New Zealand." Now, a conflict of interests between England and Russia would really be between all the parts of the map of the world marked red on the map and the interests of the Russian territory marked white. But if it comes near to a conflict in defence of our interests, it is only those two small islands, the British Islands and the Empire of India, that are in combination to produce offensive force necessary to make diplomacy felt. Now, what is the interest of Australasia in this question? Why, the lecturer has said, and said very properly, that her natural destiny is to dominate the Pacific. Is she preparing to dominate the Pacific? Not in the least. This is the case, that while that great gigantic Empire of Russia has a sea trade of 73 millions, Australasia alone has a sea trade of 104 millions. Russia has a great Navy available for any service, while Australasia has only a small squadron that costs her practically nothing tied by herself to her own waters. Therefore, I say the real lesson we ought to learn from the steady and persistent advance of Russia—an advance she has a perfect right to make, and an advance which has gradually been made through the centuries in a way that must command the admiration of all students—that advance and the fact that she commands all the resources of the great Empire for her purpose, should lead us as an Empire, and Australasia especially as part of it, to recognise that if we are to meet the steady pressure and this continued advance, it must be by organised combination of all the resources under our flag. We shall then come out of any conflict triumphant, but perhaps not otherwise.

Admiral Sir NOWELL SALMON, V.C., G.C.B.:—I only wish, Sir, to say a few words on the subject, although the ground has been cut from under my feet to a very great extent by the former speakers; still there are one or two points it is perhaps worth while to mention with regard to the present situation. I think it is an understood fact that Russia has occupied Manchuria and Corea. With Corea we have nothing to do. We have never pretended to have any interests particularly there, and we have never made an attempt to occupy it or to hold any interests whatever. But with Manchuria it is different. If you look at the map you will see that on a direct line between Port Arthur and Kirin, which includes Mukden, lies Newchwang, which is a Treaty Port. Can anyone believe Russia occupying Manchuria will allow that Treaty Port to exist any further? In that case, what becomes of our treaty rights? Where shall we commence to enforce our treaty rights? I believe if we commenced with Newchwang, we could save Peking and the Chinese Government as it exists now. We might fail, but if we were successful we should do so. But if we want to save Peking and the

Chinese Government as it exists now, we must begin with our treaty rights at Newchwang. If we give up those rights for different reasons, from convenience we will say, and because Russia is already there, and because when the railway is open there will be no sea trade to speak of—it would all come by rail—where are we to draw the line? On the south side of that Gulf of Pe-chi-li, at the end of the Shan-tung Peninsula, is Chefoo. The Germans occupy the promontory, and it is only natural, I believe, that they will endeavour to absorb Chefoo as well as the rest of the peninsula. Are we to let that go? Near the mouth of the Pei-ho River is Tien-tsin, another Treaty Port. It is so convenient for the Russians to walk in there from Peking that it is perhaps hardly worth while keeping it. Then where are we to begin? It is for our Government to decide where they will begin, where they will put their foot down, and to stick to it. I believe it is too late to save Peking. Peking and its Government are actually non-existent as far as China proper is concerned. I believe that another central Government will have to be established elsewhere—I hope at Nankin—but with regard to any of the Treaty Ports south of the Gulf of Pe-chi-li, including Shan-tung, I have no doubt in my mind whatever that we should, if necessary, fight for them. I beg to thank the lecturer for the very comprehensive lecture he has given us, in speaking on which I have only endeavoured to illustrate one or two salient points.

The CHAIRMAN (Sir Lepel Griffin):—I would like to ask Mr. James Huddert, who represents for us to-day Australia, to say a few words, especially with reference to what has been said with so much force by Sir John Colomb.

Mr. JAMES HUDDERT:—I feel greatly indebted to the lecturer for affording me an opportunity of listening to this statesmanlike paper. It is rich in suggestion, and has evidently given all of us food for thought, and we have had some very rich experiences by way of discussion. When I saw this paper it raised a question which is often raised in the minds of thoughtful Englishmen, and that is, Has the British Empire reached its climax of greatness? I do not think it has reached its climax of usefulness, and I do not see any race but the English-speaking race with which we so gladly associate, our friends in America, that can do the work of civilisation, that can carry with it the freedom that the English people wherever they go do carry with them. I hope that this great Chinese question will be dealt with with that sagacity and that ability with which it ought to be dealt. Mentioning the word ability, I took note the lecturer said it was not for want of ability that we did not deal always successfully with these questions. To a man like myself, who has lived for nearly a generation by "the long wash of Australasian seas" and in the Pacific, one is struck on coming home by the exuberance of ability that one sees here, able men who seem never to get the opportunity of bringing out all that is in them; and one wonders whether our system of party-government is the most scientific means of bringing to the front our best men. Certainly, looking at the map, we have done pretty well in the past. There is a good deal of red on it. Looking back on history, we see some notable mistakes of our illustrious forefathers, notable mistakes like the State of Maine belonging to the United States, pushing us away up to the gulf there. But on the whole we have done extremely well, and one is led to hope that this difficult, perplexing question of China will be ably dealt with. Coming to the point on which I have been asked to say a word as to how this will affect Australians, I was not surprised that our old friend Sir John Colomb took advantage of the opportunity to remind our Australasian friends that in his opinion, and in the opinion of a good many more, we Australasians and Canadians are not doing our duty to the British Empire, in the way of contributing to the cost of the maintenance of the Empire. Now there is a very great deal to be said on that behalf. I have always said, and I repeat it to-day, that when that question is brought forward in a proper way before the representative statesmen of Australasia, it will be dealt with honestly

and courageously. No man is worthy of living under the shelter of the British flag who is not prepared to pay for that British shelter his full quota. It will be found, I venture to say, that the Australasians are not only loyal, and the Canadians are not only loyal—ultra-loyal, as you say—but that they are prepared to contribute their fair share of the cost of maintaining the Empire solidly. It wants to be put before them in a fair way by responsible statesmen, and I think we must all agree with Sir John Colomb when he said that it is only by standing solidly shoulder to shoulder that we shall keep the Empire together. Australia has everything to gain by living within the Empire, and by seeking the shelter of the British flag, and by being an indissoluble part of the Empire; and she has nothing to gain, neither has Canada, by being outside of it. Of course, the trade question vitally touches Australia, when you begin to talk about the potentialities of China. That wonderful animal which multiplies so prolifically in Australasia, the merino-sheep, which is a marvel, which seems to live on nothing and can produce wool for millions more, is one of Australia's possessions, and the demand of these millions can be developed through the opening up of China. There is no doubt that it is a matter of very great importance, and always must be to Australia, to see that the hands of British statesmen are assisted in taking a bold policy on such a question as China. I can only say in conclusion that there seems to me to be but one word that adequately describes the way in which the British Empire has been built up, and that word is by "courage." The same courage that has built it up to what it is will have to be sustained—continuously sustained—and we must not fail from the craven fear of being great.

The CHAIRMAN (Sir Lepel Griffin):—Although the time is getting on, there is one gentleman here whom I think we should ask to address us. He is a very distinguished man, who has had as much experience in China as any person here to-day, viz., Colonel Man, who served under General Gordon during the Chinese Rebellion, who afterwards was associated with the Chinese authorities in putting down brigandage in Manchuria, where he commanded the forces which were locally raised. He has also done excellent work in Egypt, Trinidad, and elsewhere, and with so much local knowledge, I should ask Colonel Man to be so kind as to speak.

Colonel ALEXANDER MAN, C.M.G.:—I willingly obey your call, Sir, but I think it only right in doing so to say that my justification for addressing this meeting lies rather in what I know of the trade capabilities, and of the ways, manners, and state of the inhabitants of Manchuria, than in any military services I have been able to render there. After being secretary to Sir Robert Hart, I was appointed Commissioner of Manchuria under the Foreign Customs Inspectorate. Incidentally I commanded a Police Force. These facts will explain why I speak, perhaps, with the air of an authority. It is difficult on a small map to make one's meaning clear. We had better be quite sure whereabouts Manchuria is, and the extent of it, before we go on. What is left of Manchuria, as a political division, is that portion of the map coloured yellow, with the frontier there marching with Mongolia. At present—saying at present I somewhat ignore the occurrences of the last few weeks—the one way into that country is by the port which the gallant Admiral spoke of just now, at the head of the gulf of Pechili—Newchwang, so-called, but really the town of Yingtze. When I first went there the total foreign trade of the port, during the average of about seven months that it is open each season—for, remember, it is an ice-bound port half the year—the total foreign trade, I say, was valued at £1,600,000. With the exception of a furlough interval, when I rejoined my regiment for a couple of years, and a short tour of duty up the Yang-tsze, I served in Manchuria from 1873 to 1881. In that time the trade increased from the £1,600,000 I spoke of just now, until, before I left, it had touched £3,000,000. Please understand that was not entirely British trade. I am speaking of European trade. But in that European trade, Great Britain and her

Colonies—India and Australia—had the lion's share. You will agree with me that it was a trade worth having, and worth fighting for—diplomatically, at any rate. During the same seven years the European tonnage engaged in carrying produce to and fro increased from 150,000 to 330,000 tons, and that volume of shipping was about equally shared under the British and German flags. There was a tendency, which has developed since, for steamers to carry the trade; and this was in our favour, as we were ahead of the Germans in steam, although not in sailing craft. Therefore, to us, the trade of Manchuria was distinctly of greater value than to anybody else. Now, how was the trade worked? The trade went in at Newchwang, as we have seen. Until it passed Mukden—which you have heard spoken of as the historic capital of the Manchu dynasty, and as the cradle of the race—and had got as far north as Kirin, it met no competitor, because there was no paying way of getting into the country except by the port. But the moment it reached Kirin, it touched an entirely new set of conditions. The roads in Southern Manchuria are so bad, during summer, that the carriage and distribution of goods is, there, a matter of excessive difficulty; but the northern provinces have magnificent water-ways. At Kirin you find a river which flows, in the first instance, westward, runs a short distance north, then strikes away again north-east, and carries you to the Amur. It is the Sungari. On the right bank of that river is an important distributing centre called Petuna; and at Petuna a man who goes to Manchuria with a view of looking about to see what trade is going finds Russian goods.[1] Russian goods in 1873 had begun to penetrate in small quantities as far south as Petuna, but no further. I particularly draw your attention to Petuna, as a chief distributing centre, in order to show the line by which Russian trade will surely come in. The lecturer told us that some people have stated that the trade value of Port Arthur is nil, and that it will not affect us. Well, I think I have shown you that whatever may prove to be the trade value of Port Arthur—you see it is down there to the south—no question arises as to the trade value of Newchwang. Our vessels have little occasion to go to Port Arthur during the summer months if we have Newchwang. Mr. Colquhoun referred to the hinterland. But for the admirable remarks of a lady so much respected by all of us from Eastern Asia—a lady whose works we have all read and admired—I might briefly, perhaps, but for the fact that she has already covered the ground, describe the country to you. I shall not now venture to do so. Nevertheless, there is just one point upon which I should like to detain you for a few moments. It concerns the population of the hinterland. I have heard a good character given to it by more than one speaker here this afternoon, but I have heard no reference made to the remarkable fact that the inhabitants of Manchuria to-day are not the restless race of your imagination and the heroes of your histories. The Manchus, whom schoolboys learn to reverence as gallant warriors who have carried their arms from the Yellow Sea to the Caspian, are, for all practical purposes, extinct. China called upon them for countless recruits, beginning when she fought us in the early forties, and going on until she crushed the Mahomedan rebellions in recent years. She drew upon their manhood and carried it away wholesale, and she squandered thousands and thousands of lives in her campaigns of Central Asia. The poor remains of these clansmen, as an organised fighting body, are in sedentary garrisons. You may meet Manchu soldiers at Foochow, you may meet them at Canton; but you will go far afield indeed in Manchuria before you will meet them there. The few Manchu-speaking men whom you will now meet in Manchuria are by no means fighting persons. They are, generally speaking, descendants of the better classes who could not

[1] Since making these remarks, I have seen a special article in the *Times* of March 7th, "from our special correspondent." I wish to express my sense of the admirable work he has done—under difficulties I am well able to appreciate. He is an entire stranger to me.—A. M.

leave home, and who remain perfectly contented to live a life of ease on their feudal holdings. Their place in the working life of the land has been taken by immigrants from Shantung, and from Shan-si, who have streamed round the head of the gulf, or who have gone across to the coast. These have gradually been increasing year by year, and notwithstanding prohibition—because there has been prohibition—they have, by ways and means perfectly well understood by everybody who has had to do with Chinese officialism, been allowed to settle and to be joined by their friends. At this present time many of the most fertile districts of Manchuria, I might say nearly all the most fertile districts, are inhabited by a race of men who not only possess fine physique, and are sober, hard-working, and industrious; but who, if I know what men are, have got the making of some of the finest troops in the world in them. I have had in my day to work with many so-called inferior races, and I know very well the prejudice that exists against the yellow race in particular. I know that there is a silly idea prevalent that a Chinaman is a cowardly skunk, whom a Japanese, for example, has only to look at to make him run away. That may be roughly the case in some of the seaport towns where the ordinary travelling Briton has come into contact with the scum of the population; but it is, nevertheless, an absurdly false estimate of the people who inhabit the Celestial Empire. Especially is it untrue of the peasantry of whom I have just been speaking. I have travelled in and out amongst them, and I know them well. I know that there are few countryfolk who are more kind and hospitable, while at the same time they seem to be thoroughly removed from subserviency. They do not cringe to the first man who comes along, and are not cap-in-hand people by any means. One remark more, if I may go on for a minute or two. A very distinguished gentleman who has addressed you spoke about the necessity of Great Britain protecting at least the 18 provinces. I understood him to mean the 18 provinces of China proper, without the outlying territories which go to make up that Empire. Well, the 18 provinces of China proper certainly do contain the intellect and the money of the country; in other words, they cover that part into which it is especially our interest to push our goods. I grant it, but unfortunately the 18 provinces of China, geographically considered, are indefensible. If Great Britain had the Armies of Germany and France combined, she could not defend the 18 provinces. Only by means of the outlying territories have they ever been defended. The 18 provinces themselves have no mountain barriers and no river barriers to the north. They are bordered by plains, and it is because of that—and because of that alone—that the Manchu is in power to-day. He came down from the North and annexed the open land. The Chinese native dynasty could not hold its own because it had no natural northern frontier. You may depend upon it, Sir, that if we are going to wait for a natural frontier to stop Russia's further steps, we shall have to wait until she reaches the Yang-tsze, for that is the next dividing line.

Colonel MARK BELL, V.C., C.B., R.E. (Commanding Royal Engineer, Plymouth), not being present, has forwarded the following remarks:—

Beyond expressing my concurrence with the views of Mr. Colquhoun I will confine my remarks to illustrate chiefly "the virgin field of enterprise and commerce" offered to us by China along the line of, and bordering upon, the great Central Asian trade route from Peking to Kashgaria, traversed by me in 1887, and to show how necessary it is to our national prosperity that we should continue, as in the past, to be her chief carrier and supplier, and to ensure this by the safeguarding of our interests, and by the construction of the necessary lines of railway branching from ports on the Yangtze-Kiang to Peking and Lan-chow-fu. With Russian railways reaching to the Yellow River at Si-nan-fu, the ancient capital of China, and the Yangtze, these elements of national prosperity may pass to Russia, for commercial activity is a natural characteristic of the Russian race, and I was much struck with the tenacity with which, at such a place as Hami, a small oasis to the north of the Gobi desert, her merchants clung to

their posts amidst every discouragement, and even oppression; they dress as Chinamen, and are content to conduct their business in a very humble manner, and to carry it on with a small profit, serving behind their own counters; under similar circumstances our merchants would not stay a month. I was equally struck with the want of British commercial enterprise in the interior of China; our merchants are content to settle at the Treaty Ports, and to lose sight of their goods when once they leave them, and their Chinese agents are mulcted by the extortion of local mandarins, illegal dues being exacted contrary to treaty rights, notwithstanding that transit passes may have been taken out, covering all "likin," or inland tax. I heard of boat-loads of bales of Manchester goods being delayed for days between Hankow and Si-nan-fu, the capital of centre and north-west China, a city second only to Peking, because the boatmen refused, in the first instance, to meet unjust imposts. Eventually these had to be paid, otherwise every bale of goods would have been opened and examined. Travelling British agents might with advantage be appointed, to have their headquarters at the chief inland towns to regulate the transit of goods. Travelling for trade purposes is within treaty rights, and if we do not avail ourselves of our rights the Chinese are apt to consider them as lapsed, and exhibit in these matters in a marked degree one of the characteristics of a barbarous people, viz., that of regarding intercourse with foreigners as a deplorable violation of that isolation which is their greatest aspiration to maintain. I heard of but one British agent in the whole of my journey between the Yangtze-Kiang and the Gobi desert, and he was stationed at Kwei-hua-cheng, no great distance from Peking, and regulates the Mongolian trade of Messrs. Collins and Co. When I was at Lan-chow-fu, capital town of Kansuh, a Russian merchant with his wife, and a party of five or six Russians, arrived there in charge of a caravan of fifty camel loads of miscellaneous goods. A commissioner of customs, a Belgian, was stationed by the Chinese Government at Su-chow-fu to regulate this trade; similar Customs agencies (Europeans) are required at all frontier and principal inland towns or trade routes, as well as consuls at various points to effectively deal with local mandarins, etc. From Lan-chow-fu, onwards through Kansuh and Kashgaria, I found Russian agencies regulating and pushing trade, and occupying shops, and with Consuls at Kashgar, Kulja, and Chugerchak, etc. These remarks will suffice to show how far Russian enterprise exceeds ours in inner China, and what leeway we have to make up. As Russian communications improve and develop, competition with ourselves will become more and more keen, and necessitate corresponding exertions on our part; they cheapen their goods to gain a market and study the tastes of their customers. As to the agricultural and mineral wealth of China along the line traversed there is no doubt. The most extensive coal-fields in the world border it, and the rich loess soil, requiring nothing but rain to manure it, compasses it on either side well into Kansuh. Shan-si is rich in coal and iron and salt, and Shen-si produces abundance of grain, besides cotton, opium, and tobacco. Iron is found about the Han river, south of Si-nan-fu. To utilise this wealth a railroad is required from Peking *viâ* Pau-ting-fu to Honan (rich in minerals, coal, and iron ore: and soil and population), on to the Yangtze-Kiang at Hankow, while branch lines through Tung-Kwan to Si-nan-fu and Lan-chow-fu, and through Shen-si and Shan-si are indispensable. Coal abounds about Peking, and beyond the desert, in the Tian-shan Mountains, it is both bituminous and anthracite and practically untouched, and crops up on the surface. Kansuh produces grain, tobacco, medicines, felts, mules, cattle, opium, etc., and together with Shen-si is ready to receive twenty millions of people, it being a popular fallacy that China is everywhere over-populated. Mahomedan rebellions have depopulated these provinces. Szchwan produces sugar, silk, opium, tobacco, salt, coal, rhubarb, wheat, barley. For all this wealth there is no development and no markets, for there is no transport. As imitation is the sincerest flattery, let us now flatter Russia by imitating her example, and push the sale of our goods inland, regulate

80
90
100
110
RUSSIAN
Yeniseisk
Tomsk
Achinsk
Krasnoiarsk
Kansk
Ny-Udinsk
Barnaul
Irkutsk
Lake Baikal
R. Lena
Kirensk
MONGOL
GOBI DESE
South Altai Mts
Barkul
Chami
Ulhas
Khangai Mountains
Inshan Range
Hoang-ho
Dun-chaw
GREAT WALL
TSAIDAM
Nan-shan
Lan-chau
CHINESE EMP
TIBET
Tsin-ling-shan
Han-chung
Pao-ning
Cheng-tu
Chung-king
Su-chau
Nong-puon
ASSAM
Manipur
Mandalay
Sagaing
BURMA
TONG KING
Gulf of
Luang-Prabang
Tong-king
Kiang-mai
(Zimme)
Irawadi R.
Prome
Rangoon
SIAM
ANAM
Moulmein
Gulf of
Martaban
100
110

EASTERN ASIA.
Showing spheres of influence and existing and proposed Railways.
English Miles.
Existing Railways thus,
Proposed " "
Treaty Ports " Shanghai.
SEA OF OHHOTSK
EMPIRE
SAGHALIN
MANCHURIA
EAST GOBI DESERT
Kin-gan Mountains
JAPAN SEA
YELLOW SEA
EAST CHINA SEA
SOUTH CHINA SEA
JAPAN
YEZO
SHIKOKU
KIU SHIU
LIU-KIU or LU CHU Is.
FORMOSA
HAINAN
LUZON
Tropic of Cancer
Korea Str.
Van Diemens Str.
Hainan Str.
Gulf of Tartary
Korea Bay
Gulf of
Hong-Kong (Br.)
Amoy
Shanghai
Ningpo
Foochow
Tokio
Yokohama
Nagasaki
Hakodate
Sendai
Osaka
Kiukiang
Hankow
Chinkiang
Nanking
Tientsin
Peking
Kalgan
Kirin
Mukden
Newchwang
Port Arthur
Chefoo
Wei-hai-wei (Br.)
Kiao-chau (Ger.)
Swatow
Canton
Hoang-ho
Yang-tse-kiang
Pei-ho
Amur R.
Yablonoi Mountains
Stanovoi Mountains
Lake Baikal
Dalai Nor
R. Aldan
R. Lena
R. Amur
R. Ingoda
R. Onon
R. Kerulen
R. Ussuri
Sea of Japan
Tsugaru Str.
La Perouse Str.
Tatarsky Str.
Formosa Str.
Quelpart
Tsushima
Saddle I.
Sannan (South I.)
Hainan (Middle I.)
Sambok (North I.)
Liu-kiu
Great Wall
Kiao-chau
Wei-hai-wei
Port Arthur
Korea Bay
Gulf of Pe-chi-li
Yellow Sea
East China Sea
South China Sea
Sea of Japan
Sea of Ohhotsk
Gulf of Tartary
Tropic of Cancer
F.S. Weller, lith.

our traffic by European agencies and consuls, and develop it by opening up communications from the Yangtze-Kiang to both north and south. By commerce we have become great and prosperous, and by it we must continue to progress and be prepared to back it when necessary by force. Our political objective should seem to be to prevent India becoming a beast between two burdens, Russia in Turkey and Persia on the west, and Russia in China on the east, and this can only be done by taking steps to defend her on the Yangtze-Kiang and the borders of Afghanistan. We are apt to forget that we may maintain the strongest fleet and yet lose empire on land, by loss of India, and it behoves us to use our sea power while yet it will serve our purpose. Besides India we have to safeguard Australia's future in the Far East, a continent which has hitherto held her power dormant; but the time has now come for her to federate and improve her forces, both military and naval, and to re-model her fortifications, for the clouds in the North Pacific loom darkly towards her, and she has to remember that a bold initiative is ever the best defence. She should aim at a high destiny in the Far East. Why do our Australasian cousins remain passive?

The CHAIRMAN (Sir Lepel Griffin):—Although there are many other gentlemen here who are full of knowledge and authority, we have been going on for so long that I must ask you to excuse them this evening. I would, in concluding this most interesting meeting, venture on your behalf to express our thanks to the lecturer for his exceedingly able paper. It is, I think, a paper which is full of suggestions, and has been written with discretion and reticence. There is no use in aggravating a difficult situation, and I think we may all feel with the distinguished speakers who have addressed you to-day the responsibility of the present situation. For myself I have nothing to say. On other occasions I sometimes talk at great length, but my opinion is that a chairman's duty is merely to suggest to other people, and not to join prominently in the discussion. I would therefore only again express our thanks to the lecturer, and close for to-day our interesting meeting. I should like also to express our grateful thanks to this illustrious Institution, which has extended to us its hospitality.

A NEW SYSTEM
OF THROWING HIGH EXPLOSIVES.

By HUDSON MAXIM.

Thursday, June 24th, 1897.

Vice-Admiral Sir N. BOWDEN-SMITH, K.C.B., Chairman of Council, in the Chair.

FOR a generation there has been a race for supremacy between guns and armour, between penetration and resistance, between offence and defence. This race has resulted in the development of cannon of comparatively small calibre, but with great thickness of wall and tremendous weight, in order to withstand the enormous pressures necessary to impart requisite velocities to long and heavy armour-piercing projectiles. Powder space within the armour-piercing shell has been sacrificed to weight and strength of metal, reliance being mainly placed upon the smashing effect of a huge bolt of steel. Opposed to this we find the modern battle-ship, clothed in a wall of steel so ponderous as to reduce mobility to a minimum.

We find in history something like a parallelism with this before the invention of firearms, when warriors clothed themselves in armour, which was constantly increased in weight and strength, to resist penetration of improved weapons. However, upon the advent of firearms all armour was cast off, for it was found impracticable for an individual to carry sufficient armour to withstand the penetrating force of missiles hurled by gunpowder; resistance to penetration being wholly sacrificed to mobility.

Now, with the advent of a system of throwing high explosives, in sufficiently large masses to render armour absolutely useless, we shall find Navies discarding their armour, and everything will be made subservient to speed and mobility. This will work a complete revolution in the construction of ordnance and ships-of-war. Heavy ordnance, instead of being made, as at present, of small calibre, with thick and heavy walls, will be made of much greater calibre, and with comparatively thin walls.

The projectile which will then be employed will be a thin shell, simply thick enough to support the mass of contained explosive in its flight from the gun; and the explosive will be sufficient in quantity to work infinitely more destruction upon any target than such projectiles as are at the present day thrown from heavy guns.

One of the requisites of primary importance to a system of successfully throwing high explosives in large masses, rests upon the propelling charge—upon a suitable gunpowder—one which shall give a sufficiently low initial pressure, and maintain that pressure behind the projectile in its flight throughout the entire length of the gun, and a powder which will with absolute certainty, burn alike at all times under like conditions, in order that predetermined pressure and velocities may be depended upon.

I first began the investigation of the subject of high explosives and smokeless powders in England in 1889. Since that time I have built two powder mills in America, one for the manufacture of high explosives, the other for smokeless cannon powders. In connection with my other work on these lines, I conducted a large number of experiments for the Pneumatic Torpedo and Construction Company, of New York, formerly known as the Zalinski Pneumatic Dynamite Gun Company, looking to the production of a smokeless torpedo powder; that is, a powder for the purpose of throwing high explosives, or aerial torpedoes, from ordnance.

The distinguished chemist, Dr. Robert C. Schüpphaus, has been associated with me in this work. He is also an inventor, and his extensive chemical knowledge and experience in connection with nitro-compounds particularly qualified him for this work.

Owing to the shortness of range of the pneumatic guns, and to the expense, cumbersomeness, and vulnerability of the plant necessary to operate them, it was determined, if possible, to substitute gunpowder for compressed air. How well we have succeeded in the Maxim-Schüpphaus smokeless powder to accomplish the desired results, and the special advantages that this powder has for the purpose, is one of the things which I shall here try to explain.

The Maxim Powder and Torpedo Company, of New York, was organised to succeed the Pneumatic Company in this work, and to operate in the United States of America.

The value of high explosives in naval and military operations is becoming more and more to be recognised. Submarine mines and various forms of self-propelled torpedoes have shown us how a well-directed blow, from even a comparatively small charge of high explosive, may throw a huge battle-ship out of action, or send her to the bottom. Some types of auto-mobile and dirigible torpedoes have reached a very high state of perfection, and their evolution has led to the torpedo-boat, and, again, to the torpedo-boat destroyer.

One of the great advantages of high explosives as an agency of destruction is the impossibility of opposing to them any efficient means of protection, when applied in large quantities. By the sub-division of the hull of the modern battle-ship into a honeycomb of water-tight compart-

ments, and by surrounding it with torpedo netting, some protection is secured against attack from even the largest of present forms of torpedoes, such as the Whitehead, but the largest and latest type of these will carry but 200 lbs. of guncotton. It remains only to be able to attack with a sufficiently large quantity of explosive in order to render absolutely useless as a means of protection all precautions in the form of network and water-tight compartments. Five hundred pounds of guncotton exploded against the torpedo netting surrounding a modern battle-ship would ensure her destruction, to say nothing of what would result from the explosion of still larger quantities.

In order to form a correct estimate of the value of any system of warfare, two things are chiefly to be considered—expense and efficiency. For coast defence that weapon is best which, at a given expense, will cover entrances to harbours over the greatest range, and in itself expose to the fire of the enemy the least risk of material loss. At sea that weapon is best which, at a given cost, will be most effective in the destruction of other vessels and of coast fortifications; and you shall judge whether there is any system which embraces all these requisites to the extent that does the system of throwing aerial torpedoes shown you to-day. I believe you will agree with me that half a ton of dynamite would be a less desirable visitor upon the deck of a battle-ship, or in the water beside her, than would the largest of the present forms of shell thrown from high-power guns. It is only necessary, therefore, to show that these results are within reach, and easy of attainment.

The nearest approach to the system proposed by me for throwing high explosives that has yet been developed is the system of throwing them by means of compressed air. But the shortness of range of pneumatic guns, the difficulty and expense of protecting them, and the enormous plant of engines, boilers, and air-compressors necessary, are strong objections to their use for coast defence; while their cumbersomeness and vulnerability, together with the above objections, render their employment on ship-board entirely out of the question.

With the 15-inch pneumatic guns that have been erected in the United States, at Sandy Hook, and San Francisco, 500 lbs. of high explosive may be thrown a distance of about one mile and a quarter; 200 lbs. about two and a half miles; this is the maximum range. Hence a battle-ship could lie just beyond the range of these guns and destroy the entire outfit, without in turn being in the least exposed to the fire of the pneumatic tubes. It is obvious, therefore, that a practical system of throwing aerial torpedoes must have a range substantially equal to that of high-power guns opposed to it, and the quantity of high explosive thrown must be sufficient to effect upon the target greater destruction than can be effected by ordinary shells thrown from heavy ordnance.

As a weapon for the destruction of submarine mines in the advance of a fleet, there are no means at the command of the naval engineer at the present time which can stand the least comparison with the aerial torpedo.

In the projection of large masses of high explosives from guns, it is necessary to be absolutely certain that a premature explosion shall not occur; and the integrity of the projectile, or aerial torpedo, must be such as to secure it against disruption from the shock of the propelling powder charge; and it is better to select a high explosive which shall not be so sensitive as to be in the least endangered by the shock of acceleration exerted upon it in the gun.

Fig. 1, Diagram I., is a sectional view of my improved aerial torpedo and fuse, carrying half a ton of compressed wet guncotton. Fig. 2 is a 12-inch torpedo of the same pattern, carrying 250 lbs. of guncotton. The object of this invention is, mainly, to provide an aerial torpedo projectile which shall carry a maximum of high explosive, with a minimum weight of metal, and at the same time be of such constitution, strength, and integrity, as to enable it to withstand the shock of acceleration and the pressure of the propelling gunpowder charge, without danger of disruption or distortion of the torpedo, or the premature explosion of it.

The torpedo projectile is preferably made in two sections, a forward and a rearward portion, and joined together in the following manner:— The forward portion is made somewhat thicker than the rearward, and the rear end of the forward section is reduced in thickness sufficiently to permit of the two portions being telescoped together, as shown in the drawing. The parts are made to fit closely, and are forced together with considerable pressure, in order to make a very tight joint.

To effect the simultaneous rotation of both portions of the torpedo, they are provided with interlocking projections or tongues, and a strong copper driving ring is shrunk or affixed upon the projectile at the point of union of the two sections, and overlapping both portions, thus forming an efficient hermetical seal, while at the same time joining the two portions firmly together.

A very suitable high explosive for this torpedo is wet guncotton, previously highly compressed in a series of suitable moulds of proper size and shape, to adapt the cakes or blocks to closely fit a corresponding space in the torpedo. After the torpedo has been filled in the manner described, to such fulness as to prevent the rearward section being forced quite home upon the forward portion, or abutting against the thicker body of the forward section, the two ends are placed together, and the torpedo is subjected to considerable pressure in a longitudinal direction, sufficient to secure the maximum density of the contained high-explosive charge. The gas check and driving ring is then affixed in the manner already explained.

When compressed guncotton is used for filling the torpedo in the manner described, its density and unyielding nature cause it to serve as a support to the walls of the projectile and prevent its disruption or distortion under the great pressure of gases of the gunpowder charge, and the sudden shock of acceleration, thus permitting the use of thinner walls than when filled with a more yielding material.

The walls of the forward section of the torpedo are made thicker than

those of the rearward portion, in order to give greater weight to the forward end of the torpedo to secure a truer flight, and also such strength as to enable it to penetrate deck armour, or earthworks before exploding.

Figs. 2 and 3, Diagram II., represent two forms of aerial torpedo adapted to carry picric acid instead of wet compressed guncotton. The walls are made somewhat thicker, because picric acid, not being so rigid as compressed guncotton, as well as much heavier, does not support the shell so well against the setback of the explosive. Fig. 1 is patterned after the usual form of shell. Fig. 2 will illustrate the advantages of the form of shell preferably employed by me as an aerial torpedo. Both shells are made natural size, Fig. 2 carrying half a ton of picric acid, with nearly 1,600 lbs. metal. Fig. 3 carries 1,420 lbs. of picric acid, with 1,280 of metal; the total weight of both explosive and metal in each of the two shells is 2,700 lbs., but Fig. 3 carries about 300 lbs. more explosive.

Although picric acid and Maximite do not offer the same support to the shell as compressed guncotton, still they have a much higher specific gravity, as well as possessing much greater force per pound. Therefore, the enormously greater energy which they represent per unit volume permits the use of a shell with much thicker walls, so that the total weight of the shell for charges of equivalent destructive energy would be about the same as for wet guncotton.

Diagram III. illustrates the position of the guncotton torpedo in the gun, as well as its size, compared with other forms of projectiles now in use, thrown from guns of half the calibre, but of greater weight, and of the same exterior dimensions from forward of the trunnions back to the rear of the gun.

The whole of the rearward section of the torpedo projects backward from the driving ring and ring seat into the powder chamber, so that the entire rear portion of the torpedo is surrounded by the gases of the propelling powder charge, which exert their pressure upon it simultaneously on all sides, causing the rearward section to move slightly forward and press hard upon the forward portion, thereby communicating the pressure of the propelling charge to the high explosive contained in the torpedo, which, from its great rigidity and density, is practically incompressible, and prevents the thin shell of the rearward section from collapsing.

It is obvious that insomuch as the torpedo extends backwards beyond the driving ring into the powder chamber, it will be accelerated just so much more by the propelling gases, which give an increased velocity equivalent to a like lengthening of the gun.

The fuse employed is one adapted to explode when the torpedo shall have penetrated to a desired depth in water, earthworks, or the deck of a ship, its action being dependent upon a certain amount of retardation of the torpedo. This fuse is the joint invention of Professor Philip Alger, of the United States Navy, and myself, British Patent No. 20439 of 1895. The fuse is, however, here provided with several improvements to particularly adapt it to this torpedo projectile. The tube containing the plunger body of detonative material is surrounded by an exterior chamber,

providing an air space about the body of the detonative material, the whole being surrounded by the body of compressed wet guncotton with which the shell is filled. The function of the exterior air chamber intervening between the detonative material and the body of wet guncotton is to provide a free space, into which, in case of any possible accidental explosion, the detonative charge may expand or exhaust itself to such an extent that it will not possess sufficient force to disrupt the walls of the air chamber or explode the surrounding wet guncotton. This arrangement effectually provides against any danger from premature explosion of the detonative charge.

The fuse is provided with a plunger body of detonative compound, consisting of 75 per cent. fulminate of mercury, 15 per cent. guncotton, and 10 per cent. nitro-glycerin, prepared according to my British patent, No. 18682 of 1894. The nitro-glycerin and guncotton being dissolved in acetone, which volatile solvent is afterwards evaporated, leaves an elastic mass resembling rubber used for erasing pencil marks, the particles of fulminate being agglutinated together by the compound of nitro-glycerin and guncotton. While this compound retains all the violent detonative energy of its constituents, still it is quite insensitive to ordinary shocks. I have fired as much as a pound of it at a time from a gun at service pressures and velocities, into a sandbank, and recovered it unexploded.

The capsule or container for the body of fulminate compound is made sufficiently strong to resist the shock of the propelling powder charge, that is to say, the shock of acceleration of the projectile; and the fulminate container is held in place and prevented from moving forward toward the chamber containing the dry guncotton, by means of strong, longitudinal flat springs, having tongues projecting into the tube and bearing upon the forward end of the container, and arranged to hold it firmly in position, and to effectually prevent its dislodgment by any handling of the torpedo, however roughly, prior to its being thrown from the gun. The springs are arranged to release the fulminate container only by centrifugal force due to the rapid rotation of the torpedo shell. At the rear of the body of fulminate compound is provided a spiral spring by which, upon the receding of the retaining springs, by the rotation of the shell, the plunger body of fulminate compound will be forced slightly forward, and the return of the retaining springs prevented, until the shell strikes some object of resistance, thus permitting the plunger body of detonative compound to then move freely forward toward and into the chamber containing the dry guncotton, at the forward end of the fuse, to explode the torpedo. The capsule containing the fulminate compound is provided with a percussion cap; and at the forward end of the guide tube for the plunger body of fulminate compound is a steel point to explode the cap and ensure detonation.

Referring again to Diagram III., the central figure shows, in section, a 67-ton built-up gun of 13½-inch calibre. It shows how it is constructed from sixteen rings, or layers of steel, shrunk upon one another. This form of construction and the enormous thickness of wall are necessary to with-

stand the enormous pressures employed, of 35,000 to 40,000 lbs. to the square inch.

The gun shown in section at the top of the drawing is one designed by me for throwing aerial torpedoes. It may be made either from a single casting or a single forged steel tube. You will observe that the diameter of the gun from the rear portion forward one-half its length is the same as that of the 67-ton gun shown in the centre, but the calibre of the torpedo gun is 27 inches, twice as great as that of the 67-ton gun; the calibre being doubled at the expense of thickness of the wall, for the two guns, as shown, are of the same exterior dimensions for about one-half their length.

We are enabled to double the calibre, and so materially reduce the thickness of the wall and lighten the gun, by simply using a pressure of 10,000 lbs. instead of 35,000 to 40,000 lbs. This innovation is especially desirable in a torpedo gun, because we do not desire to shoot with an object to penetrate armour, and do not care for a flat trajectory; we desire only an equal effective range to other types of guns, and this rarely.

In the torpedo gun we have a calibre twice as great as in other guns, and consequently have four times the area at the base of our projectile. Therefore, with a projectile of equal weight, we can get a higher velocity with 10,000 lbs. to the square inch than can be attained with the high-pressure guns employing 35,000 lbs. These calculations are based upon the assumption that we have equal length of travel of projectile in the gun, and a pressure in both cases equally well maintained behind the projectile; but we have in favour of this torpedo gun and the torpedo projectile the great advantage that, for a gun of equal length, we get a materially increased length of travel of projectile, and by the employment of a propelling gunpowder charge explained further on, which maintains the pressure practically the same to the muzzle, we are enabled to get a much higher velocity for equal weight of projectile than by the other system.

The cubic capacity of the powder chamber of the torpedo gun at the top of the drawing, behind the 1-ton torpedo, is the same as the cubic capacity of the powder chamber of the 67-ton gun shown in the centre. It will require a powder charge of practically the same weight for the one type of gun as for the other, the low pressure of 10,000 lbs. with such density of loading being secured by a special form of grain explained further on.

There are two sizes of torpedoes shown in the gun at the top of the drawing; the smaller, indicated in dotted lines upon the larger, will carry half a ton, and the larger torpedo will carry one ton of wet compressed guncotton. The total weight of the smaller torpedo is about 2,000 lbs., and the total weight of the larger a little over a ton and a half. The range of the smaller, carrying half a ton of explosive, will be about nine miles, and that carrying a ton of guncotton about five miles, and the regularity of pressures of the propelling powder charge will be such that the greatest accuracy of fire will be attainable.

The total weight of the gun shown at the top of the drawing is 47 tons, as against 67 tons, the weight of the one shown in the centre.

The gun shown in section at the bottom of the drawing is of the same calibre as the one at the top, but it is a little lighter, weighing 43 tons. This latter gun, instead of being cast in one piece, or made of a single forged steel tube, is made of three pieces, in the usual manner of built-up guns. The weight of the projectile in the 67-ton gun is 1,250 lbs. The gun to throw it costs incomparably more than would a torpedo gun throwing a projectile throwing twice to four times as much.

Diagram IV. gives a side elevation, or external view, of the three guns just described.

Wire guns are now rapidly beginning to receive the favour which they merit, and it has been found that the wire gun of 12-inch calibre and forty calibres long possesses a greater power of penetration than any of the other and heavier forms of built-up guns of much greater calibre.

Diagram V. shows four types of guns in section. The first is the 12-inch wire gun made at Woolwich; the second is the 67-ton gun (calibre 13¼ inches), the same as shown in Diagram III.; the third is a 110-ton gun, calibre 16¼ inches; the fourth and last is a torpedo gun of 24-inch calibre, the rear half being somewhat less in diameter than the 12-inch wire gun, and slightly tapered to the muzzle, and made enough longer than the wire gun to bring its weight up to 46 tons, the same as that of the wire gun.

The projectile shown in the wire gun is three calibres long, and weighs 850 lbs. With a propelling charge of 167 lbs. 8 ozs. cordite, and with a pressure of from 35,000 to 40,000 lbs. to the square inch, the projectile is thrown from the gun at a velocity of about 2,350 foot-seconds. In the torpedo gun at the top of the drawing is shown a torpedo projectile, carrying 1,420 lbs. of picric acid. The total weight of this torpedo will be about 2,700 lbs. With a powder charge of 167 lbs. Maxim-Schüpphaus torpedo powder, and a pressure of 10,000 lbs. to the square inch, and with a travel of projectile in the gun of more than seven and a half feet greater than in the wire gun, the torpedo projectile leaves the gun with an enormously greater energy than that of the projectile thrown from the wire gun, but as the projectile thrown from the wire gun has much greater sectional density than the torpedo projectile, it loses less velocity in overcoming atmospheric resistance. However, this is somewhat counter-balanced with the torpedo gun by a higher angle of fire, so that enormous quantities of high explosive can be thrown to a great distance. The torpedo projectile, carrying 1,420 lbs. of picric acid, will leave the gun with a velocity of about 2,000 foot-seconds, with a range of nearly nine miles. The torpedo enlarged to the dotted lines in front will carry one ton of picric acid, will have a velocity of about 1,500 foot-seconds, and a range of about five miles.

The total energy of projection imparted to each torpedo projectile will be practically the same. In the smaller, mass is sacrificed for velocity; in the larger, velocity for mass, so that the total energy of recoil of the gun will be practically equal for each projectile; but as there is somewhat more energy imparted to the aerial torpedo than to the

projectile thrown from the wire gun, and as the guns are of equal weight, there will be slightly more recoil to the torpedo gun, but not enough to be a source of any practical difficulty.

The same weight of powder charge will be employed in the torpedo gun for all sizes of projectiles, but the character of the grain will be different, in order that the pressure will be the same in all cases, namely, 10,000 lbs. to the square inch.

The rear portion of all torpedoes is preferably made the same length, so that the cubic capacity of the powder chamber will be the same for all sizes of torpedoes.

In making the calculations for the ballistics of the torpedo gun, I have assumed that the Maxim-Schüpphaus smokeless powder be used, with a form of grain explained further on, adapted to give a pressure not exceeding 10,000 lbs. per square inch, with full charges, and maintain that pressure behind the projectile to the muzzle, the character of the grain being varied according to the density of loading and the weight of the projectile. It would be absolutely impossible to produce anything like these ballistic results, with such a thin gun and heavy projectiles, with any other powder whatever.

In order to obtain any such velocities and ranges with any other than the Maxim-Schüpphaus torpedo powder with guns of such large calibre as these torpedo throwers, and with such heavy projectiles, a thickness of wall and weight of gun would be required so enormous as to absolutely preclude all possibility of their use.

Diagram VI. illustrates the relative sizes of a half-ton and ton aerial torpedo as compared with the ordinary projectile thrown from guns of the present pattern of equal weight with the torpedo gun, but of half the calibre; and to give a more correct idea of their real magnitude, a man is also shown in the drawing.

If we will allow the imagination a little play, and imagine ourselves on shipboard, we can easily appreciate that we should feel less secure in facing guns throwing these immense aerial torpedoes than we should those throwing the smaller armour-piercing shell.

To assist our imagination a little in its realisation of the superior destructive energy of these torpedo projectiles above the common armour-piercing shell thrown from the high-power guns of the present day, I will call your attention to Figs. 1, 2, and 3, Diagram VII., showing three types of armour-protected mounts for heavy guns. The guns are shown in side elevation, and represent the present type of high-pressure gun. The dotted lines indicate the enlargement of the muzzle portion, to show the exterior dimensions of a torpedo gun of twice the calibre and of equal or less weight, mounted in the same manner.

Fig. 1 is a sectional view through a turret of a modern battle-ship. The two projectiles shown above as about to strike the turret illustrate the relative sizes, the one of the armour-piercing shell thrown from the high-power gun, such as is shown in the mount, and the other a torpedo carrying a ton of guncotton, such a projectile as would be thrown from a

torpedo gun of the exterior dimensions represented by the gun in mount, with muzzle portion enlarged to the dotted lines.

Fig. 2 is a section through an Elswick Turret with Gruson Cupola Armour.

Fig. 3 shows an Armstrong Disappearing Gun mount.

We can easily appreciate at a glance the superior efficiency of the torpedo projectile as a means of destroying these steel-enclosed bulwarks. Fig. 3 would be demolished by a single shot, without any question, while the terrible concussion of the explosion upon or against the armoured protection of the others, even if it did not totally demolish the steel wall, would certainly throw the gun out of action and kill all the gunners, to say nothing of the wreck it would occasion elsewhere, especially on board a battle-ship. It is hard to predetermine exactly the amount of damage which would be wrought by the explosion of half a ton of guncotton, to say nothing of a ton, upon one of the turrets of a battle-ship, but the destruction, even though not fatal to the vessel, would be very extensive.

Diagram VIII. illustrates some experiments which I conducted in America, showing the philosophy of explosions, as bearing upon the destructiveness of high explosives, in their application to warfare.

The first four figures, *A*, *B*, *C*, and *D*, represent an inch and a half by 8-inch dynamite cartridge exploded upon a firm, resisting body made of a mixture of hydraulic cement and sand. *A* represents a cartridge stood on end and detonated from the bottom; *B* represents a cartridge stood on end and detonated from the top; *C* a cartridge laid flat and detonated from the centre; and *D*, simultaneously detonated from both ends. The curved lines under the various cartridges show the different effects of the explosions, the least effect being produced by the cartridge exploded near its point of contact with the earth. A much higher effect is produced when the cartridge in the same position is exploded from the top end, and a still higher effect when the cartridge is laid flat, of course, from the closer proximity of a larger mass of explosive to the area affected; craters of about equal size, but of different shape, being made whether a cartridge is exploded in the centre or at both ends. When, as in *A*, the cartridge is exploded from the bottom, the wave of explosion moves upward, and is tamped only by the air, and the unexploded body of the cartridge above; while in *B*, which is exploded from the top, the wave of explosion is downward, so that upon the explosion of the lower end of the cartridge, the gases there evolved are tamped both by the weight of the gases above, and by their rapid velocity downward; a much larger quantity of the gases being given a downward direction produces a much greater effect. In *C*, when the cartridge is exploded from the centre, the wave of explosion passing in two ways produces a longer crater than where the cartridge is exploded from both ends, as in *D*, where the waves of explosion, beginning at each end, and meeting in the middle, produce a less effect at the ends of the cartridge, and a greater effect in the centre.

In *E*, we have a very curious illustration, indeed, of explosive energy. A cylindrical body of compressed guncotton with a hole through the

centre, was placed on a piece of thin armour plate and detonated, the waves of explosion moving in all directions, as indicated by the arrows, and meeting at the centre of the hole, are diverted in the direction of the vertical arrows, with greatly increased density and accelerated velocity, thus blowing a hole through the steel plate directly beneath where the hole was in the guncotton, the plate being simply indented beneath the solid portions of the body of the guncotton.

Diagram IX. will illustrate the action of a dynamite explosion adjacent to a firm, resisting body, such as the earth's surface, or the deck of a ship. There is a well-known theory that the action of dynamite is downward and upward. It is often noted that buildings adjacent to a dynamite explosion have their windows blown out from within, and in the direction of the explosion. This figure will illustrate the action of such an explosion.

E represents an explosive body, which, if it were suspended in space, or within a body of uniform resistance and detonated, would act uniformly in all directions, as inscribed by the circle *F*; but, placed adjacent to the earth or other firm, resisting body *G*, *G*, its action is to throw the entire mass of explosive or weight of its gases upward, and the greatest display of action above the earth is in the line *H*. Now, to raise a weight, say of half-a-ton, whether the body be solid or gaseous, at the velocity of gases of explosion, requires enormous energy, without taking into account the resistance of the air. The body of explosive *E* may be likened to a ball of perfect elasticity caused to rebound from the earth exerting downward a pressure equal to the force which raises it.

Thus, a force is exerted downward, to form the crater in the line *H*, equal to the force exerted upward, and which is sufficient to raise the total weight of the body at a velocity of gases of explosion. The action of the explosion being in a vertical line, a partial vacuum may be formed, and an inflow of the surrounding air occur in the direction of the arrow *R*.

It is obvious from the last illustration that it is not necessary that a high-explosive shell or aerial torpedo should fall downward and penetrate the ship's deck, for on exploding adjacent to the deck by striking any of the superstructure, the downward action of the explosion will disrupt the deck, exert a tremendous pressure in her interior, and burst the ship asunder.

Diagram X. illustrates the direction of the action of explosion of an aerial torpedo in its transit across the deck of a battle-ship. The explosive, being tamped by its own weight, and by the resistance of the surrounding air, will re-act upon the ship's deck with a disruptive effect, similar to that of a torpedo exploded under water adjacent to the unprotected side or bottom of the vessel.

We will now extend our comparisons to other systems of torpedo warfare. Of the many types of torpedoes the most successful have been the Howell and the Whitehead. The Whitehead, standing in the lead, may, therefore, be taken as the best representative of what has been accomplished in locomotive torpedoes. The Whitehead is a perfect

marvel of ingenuity, and the accuracy with which it will travel beneath the surface of the water and strike its target is wonderful. The first torpedoes of this type carried only 18 lbs. of dynamite. The quantity of explosive has been constantly increased, and the largest and most powerful to-day carry 200 lbs. of guncutton. I will enter into no description of the details or mode of operation of the Whitehead torpedo—a subject so well known—but Diagram XI. will illustrate the comparative sizes of the largest Whitehead torpedo placed alongside one of the 24-inch aerial torpedoes already described, carrying one ton of guncotton.

The tremendous difference in the quantity of explosive carried is very striking, and speaks for the vastly greater efficiency of the aerial torpedo.

The maximum effective range of the Whitehead torpedo, carrying 200 lbs. of guncotton is less than one mile, and less than one-fifth the range of the aerial torpedo carrying eleven times the quantity of high explosive. The efficiency of the aerial torpedo is, therefore, more than fifty times greater than that of the Whitehead.

Diagram XII. is a table showing the distances at which various quantities of different high explosives will exert through water a disruptive blow upon the hull of the strongest battle-ship, and inflict a fatal injury, when a sufficient area of the hull is affected. After conducting a very large number of experiments, General Abbott, of the United States Army, estimated a pressure of 6,500 lbs. to the square inch great enough to be fatal to a modern battle-ship; while Lieut.-Colonel John T. Bucknill, in his book entitled "Submarine Mines and Torpedoes," concludes that a pressure of 12,000 lbs. to the square inch is necessary to inflict a fatal injury upon the hull of the strongest battle-ships now made. I have, in order to be on the safe side, calculated the distances shown in this table by the formula given by Colonel Bucknill, for the determination of distances at which 12,000 lbs. to the square inch will be exerted.

Guncotton and No. 1 dynamite are about equal in force, while the most powerful commercial explosive known is nitro-gelatin. Maximite and picric acid are about equal in power, and come next to nitro-gelatin.

The column of figures at the left represents the quantities of explosives employed. The line of figures at the bottom shows the distances at which the destructive pressure of 12,000 lbs. to the square inch will be exerted. The junction of the oblique lines with the right angles formed by the vertical and horizontal lines represents the distances at which the different explosives shown will exert a pressure of 12,000 lbs. to the square inch.

Five hundred pounds of guncotton will be fatal, therefore, at a distance of about 38 feet; Maximite and picric acid, about 47 feet; nitro-gelatin, about 54 feet; one half-ton of guncotton, about 85 feet; one ton of guncotton, 168 feet; while a ton of nitro-gelatin would be fatal at 250 feet. As guncotton is the standard Service high explosive in this country, I have given special prominence in the table to the destructive range of this substance.

Diagram XIII. is intended to illustrate the destructive efficiency of the blast of high explosives, as compared with the smashing effect of the blow given by the bolts of steel or armour-piercing projectiles thrown from high-power guns.

Diagram XIIIA. gives an enlarged plan-view of the deck of the battle-ship shown in Diagram XIII., with numbers showing the areas of the zones of destruction within the circles drawn about the battle-ship.

The modern first-class battle-ship costs about £1,000,000 sterling. It carries an armament of four 12-inch wire guns, twelve 6-inch, and eighteen 3 and 6-pounders, and five torpedo-discharges. Not more than one-half of the guns can be trained upon a single target at one time. Now, at an equivalent expenditure, we can construct and oppose to this ten torpedo-cruisers, costing £100,000 each. This sum will construct a very respectable sort of craft, and one which will carry one 24-inch torpedo gun weighing 46 tons and two torpedo mortars weighing 20 tons each. The cruiser would fight head on, and the exposed portion could be protected by deflecting armour, sufficiently thick to turn aside all shots thrown from a battle-ship except those from 12-inch wire guns. The torpedo gun would be capable of throwing half-a-ton of guncotton nearly nine miles and one ton about five miles. Each mortar will be capable of throwing 500 lbs. four miles, half-a-ton about three miles, and one ton nearly two miles.

The size of the target presented by the cruiser fighting head on would represent an area about equal to her cross section above that portion protected by the water, while the target presented by the battle-ship to the cruiser would be in proportion to the quantity of high explosive thrown by the cruiser; and to give an idea of what this really means there is shown on the right a modern battle-ship, and on the left a torpedo-cruiser of the character just mentioned, pictured in the act of firing upon each other. The full lines drawn from the battle-ship to the cruiser show the trajectory and angle of fire of the battle-ship, and also within what a limited angle the fire of the battle-ship must be confined in order to hit the cruiser at all. The dot and dash lines show the angles within which an aerial torpedo carrying a ton of guncotton would be fatal to the battle-ship, and the tremendous size of the target presented by the battle-ship to the torpedo-cruiser. At the top of the drawing is a plan-view showing the difference in the areas of the decks of the two vessels. Now, the battle-ship, in order to do any harm whatever to the cruiser, must, of course, make a hit, and to be fatal that hit must be made in a vital spot representing an area much more confined even than that represented by the deck of the vessel. As the cruiser would stand and fight with armoured head on, the chance of a hit being fatal would be very small; while every torpedo carrying from half-a-ton to a ton of guncotton thrown from the cruiser, and striking the area represented by the deck of the battle-ship, would at least throw the ship out of action, even if it did not sink her. But, in addition to this, we have the tremendous areas within which such quantities of high explosive, striking in the water, would be certainly fatal.

The lines drawn about the area represented by the deck of the battle-ship show the distances within which different quantities of guncotton would, according to the table, disrupt or crush the hull of the battle-ship. Half-a-ton of guncotton, striking anywhere within the space encircled by the line *A*, would exert upon the hull the required destructive pressure of 12,000 lbs.; and one ton within the tremendous area enclosed by the line *B*. But as such a blow upon either end of the battle-ship, although crushing it, would not necessarily be fatal, on account of the transverse bulkheads and water-tight compartments, I have drawn about the battle-ship two circles, representing distances within which half-a-ton and a ton of guncotton respectively falling would exert upon the hull of the battle-ship a pressure of 12,000 lbs. in such proximity to her vitals as would be certainly fatal.

The cruiser would have a speed of from 20 to 24 knots, and could therefore, choose her own position with respect to the battle-ship. Her tactics would not be like the ordinary torpedo-boat, to dash into and run a gauntlet of destructive fire from the battle-ship, to drop a torpedo and away again out of range; but she would stand her ground and fight, always at a distance and in a position of her own choice, with armoured head toward the battle-ship. In such position the target presented by the cruiser would be very small indeed, to say nothing of the difficulty of inflicting a fatal injury upon such a target with ordinary shot and shell.

The fatal area presented by the battle-ship as a target to half-a-ton of guncotton thrown from the cruiser is 47,143 square feet, and the fatal area presented to a ton of guncotton is 132,025 square feet, and it is a very safe estimate that the area exposed by the crusier fighting head on would not be more than one two-hundredth as great as the fatal area exposed by the battle-ship. Now, as every shot from the cruiser striking within the fatal area exposed by the battle-ship would destroy her, and as it would take a considerable number of hits from the battle-ship to sink the cruiser, it is very safe to off-set the greater number of shots which the battle-ship could fire within a given time and the horizontal position of the target presented by her by the superior fatality of the shots from the cruiser. This enables us to very easily approximate the comparative efficiency of the two systems by simply dividing the average fatal area exposed by the battle-ship by the area of the target presented by the cruiser. Now, as this area is contained in the area exposed by the battle-ship at least 100 times, one cruiser would be capable of destroying, on an average, 100 battle-ships. But we can build ten such cruisers for what it would cost to build one battle-ship, and we must therefore multiply this efficiency by ten. This means that we could, for the cost of one battle-ship, produce a fleet of torpedo-cruisers which would be capable of destroying 1,000 first-class battle-ships.

These are, indeed, astounding figures. They are nevertheless based on such foundation in facts as to at least warrant our placing them in a category of practical probabilities. Let us divide these figures by ten, if you like. We can still for the cost of one battle-ship build a fleet of torpedo-cruisers capable of destroying 100 such monsters. Let us go

still further, and divide by 100, and we can still destroy ten battle-ships for the cost of one.

In the choice of a high explosive for aerial torpedoes there are several desiderata, in addition to the mere force of the explosive. In the first place, it should not be so sensitive to shock or percussion as to be in the least endangered by the sudden force of acceleration exerted upon it in the gun. It must be perfectly stable and undergo no change by time and under varying conditions of temperature. It must be perfectly neutral, having no effect upon the metallic surfaces exposed to it. It should have as high a specific gravity as possible in order to exert the maximum energy per unit volume. There is one more and very important desideratum not possessed by any other explosive in like degree as by wet guncotton, and that is insensitiveness to detonation not only from shocks of percussion, but shocks of ordinary forms of explosion. Gun-cotton can only be detonated by the explosion of a powerful detonative charge in direct contact with it.

Nitro-gelatin is the most powerful of commercial high explosives, both weight for weight and volume for volume. It has a specific gravity of 1·6 when made by the old formula of 7 per cent. gelatin-pyroxylin dissolved in 93 per cent. of nitro-glycerin, and made free from air bubbles, But this explosive is too sensitive for employment in aerial torpedoes to be thrown from guns by gunpowder at high velocities. It, however, may be made sufficiently insensitive for this purpose by stiffening the jelly by the addition of more pyroxylin at the expense of the nitro-glycerin, making the proportions about 15 to 20 per cent. pyroxylin to 80 or 85 per cent. nitro-glycerin. The specific gravity, however, and the force of the explosive are both somewhat lessened when made by this formula.

Maximite is a title which was first applied to a high explosive invented by me and made according to my United States Patent No. 544924. A stiff nitro-gelatin of the character of that just above described, consisting of about seventy to eighty parts nitro-glycerin and twenty to thirty parts of a very soluble variety of gelatin-pyroxylin, soluble in nitro-glycerin below 100° Fahr. is frozen stiff and then cut into sawdust by a gang of saws. About seventy-five to eighty parts of this explosive sawdust is mixed and thoroughly incorporated with about twenty to twenty-five parts of finely pulped tri-nitro-cellulose, the whole being saturated with water. The object of the fibrous tri-nitro-cellulose is to absorb and hold water and lessen the sensitiveness of the compound. The compound may be packed into shells to a density of about 1·4, holding about 15 per cent. of its weight of water, the excess of the water being poured off.

Projectiles filled with Maximite may be thrown from ordnance at service velocities with perfect safety. This compound will detonate under the influence of a strong exploder with all the violence of the original ingredients of which it is composed.

Picric acid is a very powerful high explosive, and when melted and cast it has a specific gravity of 1·7. It is highly insensitive to all ordinary influences, and is, therefore, exceedingly well adapted for use in aerial torpedoes.

In view of the highly insensitive character of wet guncotton, and the fact that it is as powerful as No. 1 dynamite, to say nothing of the other high explosives just mentioned, it is hard to see the need of air guns if we have a suitable torpedo powder, by which low pressures can be had and maintained and projectiles with thin walls be thrown with safety.

In making a comparison between the system shown you to-day and that of the best system yet developed for throwing torpedoes by means of compressed air, erected at Sandy Hook and San Francisco, in the United States, it may be noted that the calibre of the largest of these pneumatic guns is only 15 inches, while its length is 50 feet and its weight 70 tons. Its maximum range with 500 lbs. of high explosive is about a mile and a quarter. The pressure employed in the gun is only about 1,000 lbs. to the square inch—greater pressure than this having been found impracticable.

With a 24-inch torpedo gun, like that shown in Diagram V., the same quantity of high explosive as that thrown a mile and a half by the pneumatic gun could be thrown in a sub-calibre projectile about fourteen miles, or ten times as far as with the pneumatic gun; and this torpedo gun would throw a ton twice as far as the pneumatic gun will throw 200 lbs., or more than ten times the quantity twice the distance. Notwithstanding the great difference in these two systems, still it must be borne in mind that those pneumatic guns are no toys. Lord Brassey, in his Naval Annual of 1897, says :—"The 15-inch shell threw up a column of water from 350 to 400 feet in height and 100 feet in diameter, which it is believed would destroy the largest man-of-war within an area of 100 feet square."

The Maxim-Schüpphaus smokeless powder is made in two forms of grain, one in the shape of round cylinders longitudinally perforated, and cut into lengths of from three to four diameters, varying with the size of perforation. If the perforations be small and the grain made too long, it will burst or break in the gun by the excess of pressure generated by combustion within the perforations. The other form of grain is in the shape of rods or strips, preferably rectangular, and transversely perforated, that is to say, perforated in a direction transverse to the longitudinal axis of the grain. The grains may, if desired, be made of a length approximating the length of the powder chamber of the gun. The strips of explosive may be made of any desired thickness, up to a point at which pressure within the perforations would become so great as to cause disruption. The powder grain may be covered or coated with any suitable substance to delay ignition, such as a layer of un-nitrated paper, or a coating of varnish, or the surface of the grain may be de-nitrated. We have found that form of coating to be best which retards ignition sufficiently to give combustion within the perforations a good start of combustion upon the other surfaces, but which coating will be consumed a little in advance of the interjunction of the perforations with one another.

I am aware that simply a multi-perforated grain of powder is not new, except in the form of rods or strips transversely perforated, which is

new; but that form of perforated grain and character of perforations whereby the highest ballistic results are secured is also broadly new.

Diagram XIV. shows some forms of multi-perforated grains of Maxim-Schüpphaus smokeless powder, made four times natural size. The first figure shows a strip of powder transversely perforated with round holes. Fig. 2 shows the same strip consumed from within the perforations until they have reached their maximum size and intersect with one another. It will be observed that there is left a considerable portion of unburned material.

Now, if smokeless powder be perforated with angular holes, there is more rapid combustion in the corners or angles of the perforations than upon the surfaces lying farther apart, owing to the greater confinement of the gases there evolved. I think I was the first to discover this, and to invent a powder grain having angular perforations for securing unequal combustion, whereby complete consumption of the grain is effected simultaneously with the interjunction of the perforations with one another.

Figs. 3 to 8 inclusive show strips of powder transversely perforated with angular holes, illustrating their forms before combustion and after combustion to a point just before the interjunction of the perforations with one another, the same result being effected whether the perforations be triangular, square, or hexagonal. Such strips or bars of explosive so perforated are the best form of grains for a smokeless powder. The remaining Figs., 9 to 14 inclusive, illustrate the advantages of angular perforations applied to longitudinally perforated cylinders of powder. Probably the preferable form of perforation for a longitudinally perforated grain is that shown in Fig. 11.

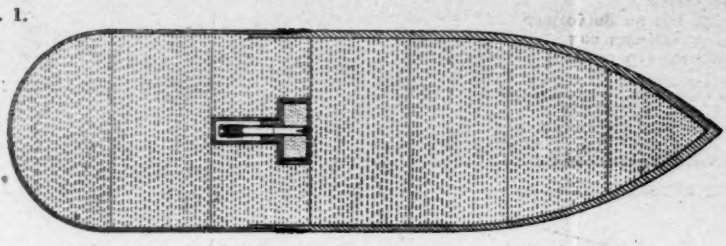
The first eight figures represent grains whose exterior surfaces have been protected by a suitable coating, to prevent ignition. The last six figures show grains which have not been so protected. The coated form of grain is not so essential for ordinary cannon powders as for a torpedo powder, although higher ballistic results may be obtained with it in both cases than would be otherwise possible.

The form of grains shown in the first eight figures presents to the flame of ignition an area of only 18 square inches of surface per pound of material, while cordite made for a gun of equal calibre would present an initial burning area of 357 square inches, or more than twenty times the initial area presented by the Maxim-Schüpphaus torpedo powder. The maximum surface presented by the Maxim-Schüpphaus torpedo powder just before the projectile leaves the gun, and at the point of the interjunction of the perforations with one another, is more than 200 square inches per pound of material (the burning area being increased twelvefold), and an area 200 times as great as presented by cordite at the same point within the gun.

I have with me some samples of both unburned and partially burned grains, which demonstrate, in a practical way, the claims made by us as to the advantages of our powder, which I shall be glad to show those desiring to examine them.

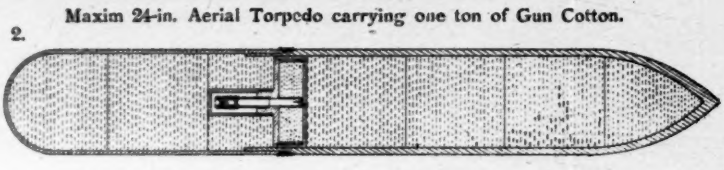
DIAGRAM No. I

FIG. 1.



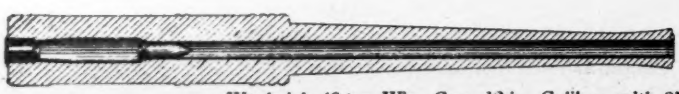
Maxim 24-in. Aerial Torpedo carrying one ton of Gun Cotton.

FIG 2.

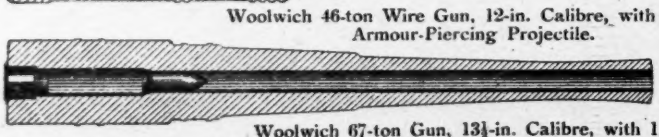


Maxim 12-in. Aerial Torpedo carrying 250 lbs. Gun Cotton.

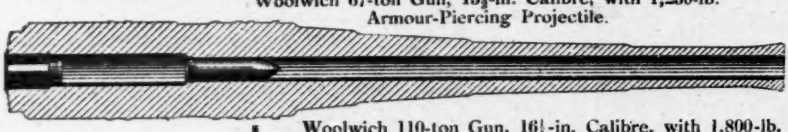
DIAGRAM No.



Woolwich 46-ton Wire Gun, 12-in. Calibre, with 850-lb. Armour-Piercing Projectile.



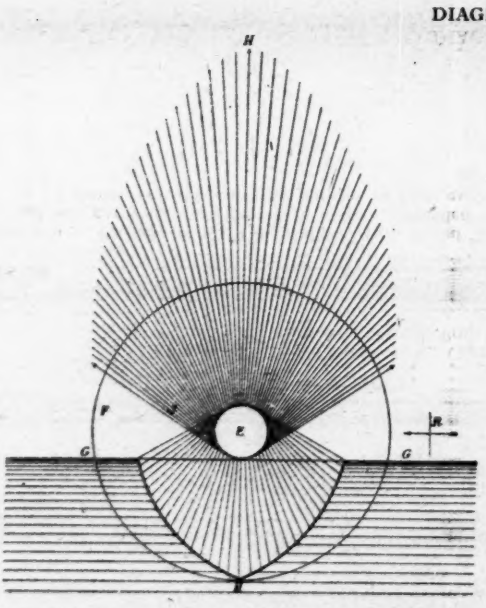
Woolwich 67-ton Gun, 13½-in. Calibre, with 1,250-lb. Armour-Piercing Projectile.



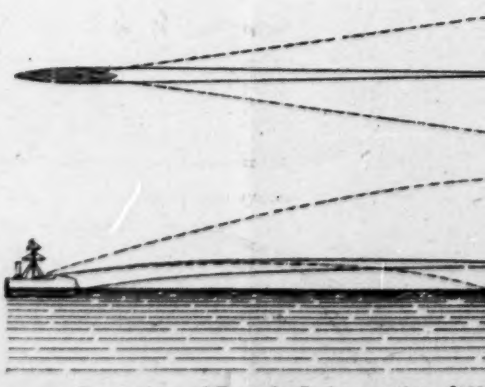
Woolwich 110-ton Gun, 16¼-in. Calibre, with 1,800-lb. Armour-Piercing Projectile.

Maxim 46-ton Torpedo Gun, 24-in. Calibre, with Aerial Torpedo shown in Chamber, carrying 1,420 lbs. Picric Acid. Extended to dotted line shows Torpedo carrying one ton of high explosive.

DIAGRAM No. 9.



Action of dynamite explosion adjacent to a resisting body like earth or ship's deck.



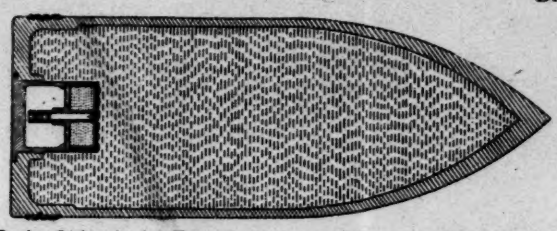
Comparison of Torpedo Cruiser costing £100
£1,000,000. Ten Cruisers at cost of one
destroying all the Battle-ships o
navies of the worl

J. J. Keliher & Co. Ltd. London.

No. 1.

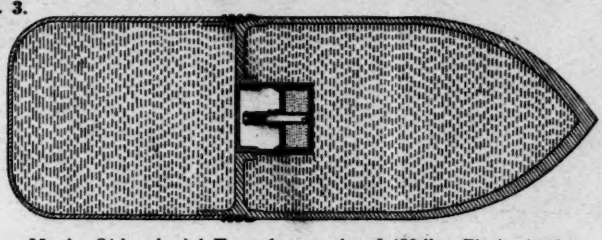
FIG. 2.

DIAGRAM No. 2.



Maxim 24-in. Aerial Torpedo in form of Common Shell carrying half-a-ton of Picric Acid.
Total Weight of Torpedo 2,700 lbs. Range nearly nine miles.

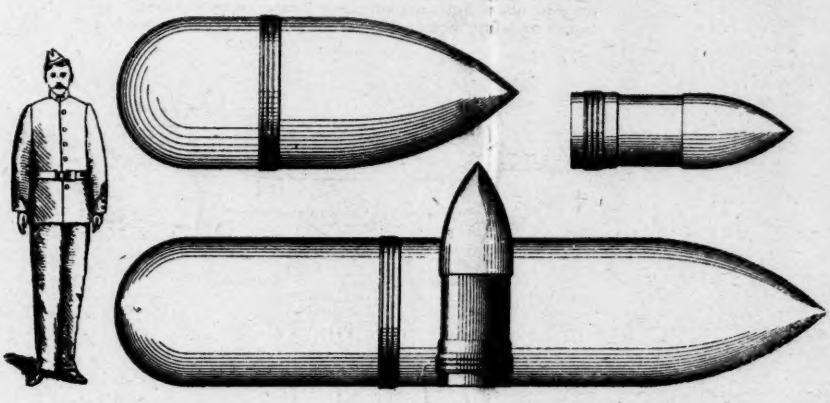
FIG. 3.



Maxim 24-in. Aerial Torpedo carrying 1,420 lbs. Picric Acid.
Total Weight of Torpedo 2,700 lbs. Range nearly nine miles.
Will destroy the biggest battle-ship when striking within 140 feet of her.

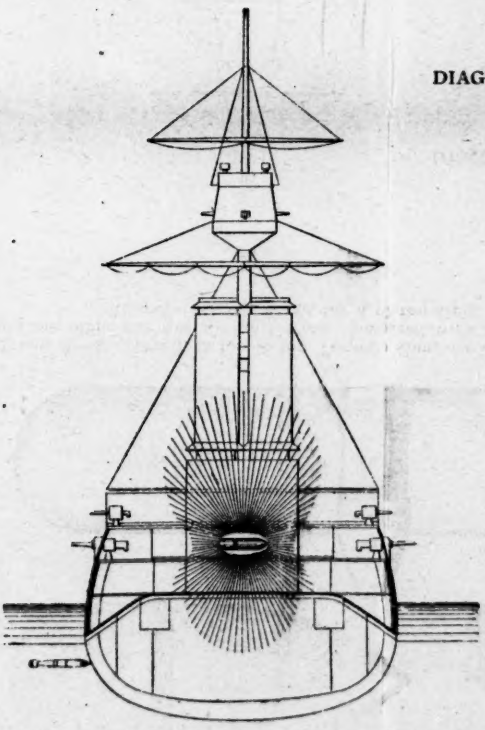
No. 5.

DIAGRAM No. 6.



Two Maxim Aerial Torpedoes for 46-ton Torpedo Gun, one carrying half-a-ton and the other one ton of Gun Cotton, compared with two Common Armour-Piercing Shells for a 67-ton Gun.

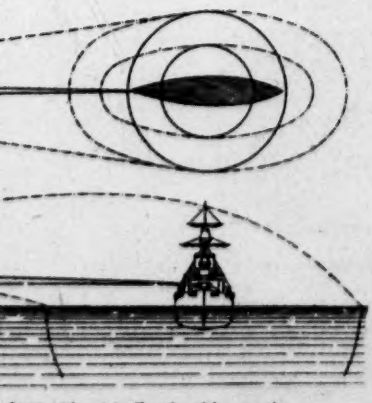
DIAGRAM No. 10.



Explosion on board a Battle-ship, of the Majestic class, of a 24-in. Maxim Aerial Torpedo carrying a ton of Gun Cotton. At lower left is seen an 18-in. Whitehead Torpedo. The black head shows quantity of Gun Cotton carried.

All the figures drawn to scale.

DIAGRAM No. 13.

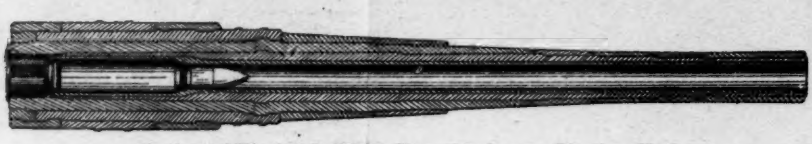


£100,000 with Battle-ship costing
f one Battle-ship capable of
ips of the combined
world.

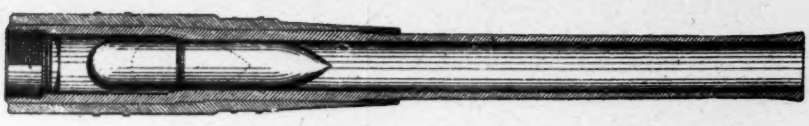
RAM No. 2.

DIAGRAM No. 3.

Section of Maxim 46-ton Torpedo Gun. Showing Torpedoes carrying half-a-ton and a ton of Gun Cotton.



Section of Woolwich 67-ton Gun with Armour-Piercing Shell.



Section of Maxim 43-ton Torpedo Gun with Torpedoes.

r.

DIAGRAM No. 7.

AGRAM No. 6.

FIG. 1.

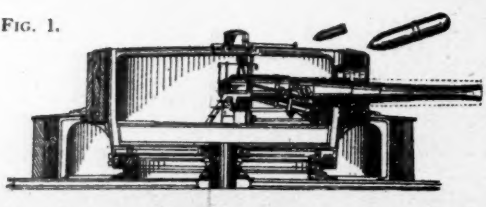
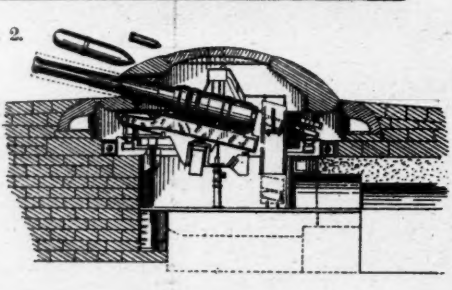
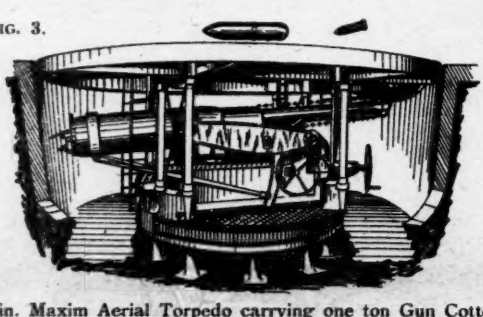


FIG. 2.



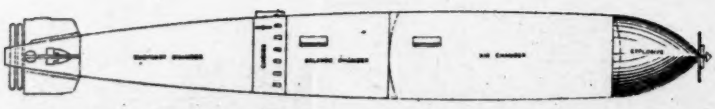
a-ton

FIG. 3.

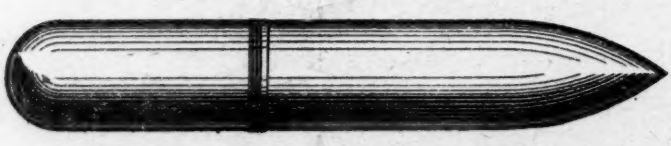


24-in. Maxim Aerial Torpedo carrying one ton Gun Cotton compared with 12-in. Armour-Piercing Shell against three types Protected Gun Mounts.

DIAGRAM No. 11.



Whitehead 18-in. Torpedo carrying 200 lbs. Gun Cotton. Range less than a mile.



Maxim 24-in. Aerial Torpedo carrying one ton Gun Cotton. Range 5 miles. 5 times that of Whitehead, carries 11 times the quantity of explosive. Efficiency therefore 5 x 11 = 55 times greater than Whitehead. Cost less.

DIAGRAM No. 13A.

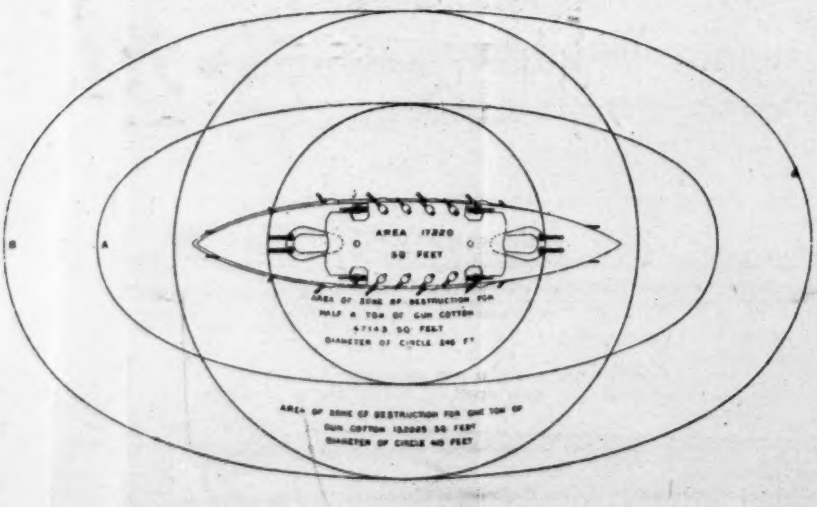
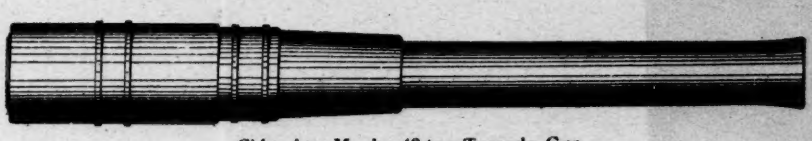

B
A
AREA 17320
SQ FEET
AREA OF ZONE OF DESTRUCTION FOR
HALF A TON OF GUN COTTON
57143 SQ FEET
DIAMETER OF CIRCLE 240 FT
AREA OF ZONE OF DESTRUCTION FOR ONE TON OF
GUN COTTON 103025 SQ FEET
DIAMETER OF CIRCLE 460 FEET

DIAGRAM No. 4.

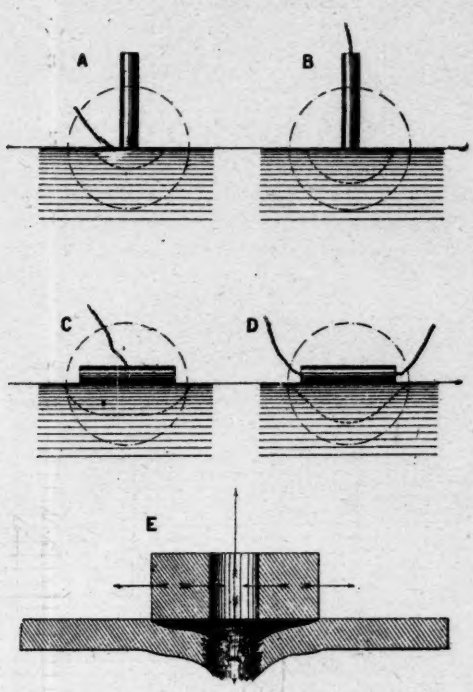
Side view Maxim 46-ton Torpedo Gun.

Side view Woolwich 67-ton Gun.



Side view Maxim 43-ton Torpedo Gun.

DIAGRAM No. 8.



Some experiments on the philosophy of explosions.

DIAGRAM No. 12

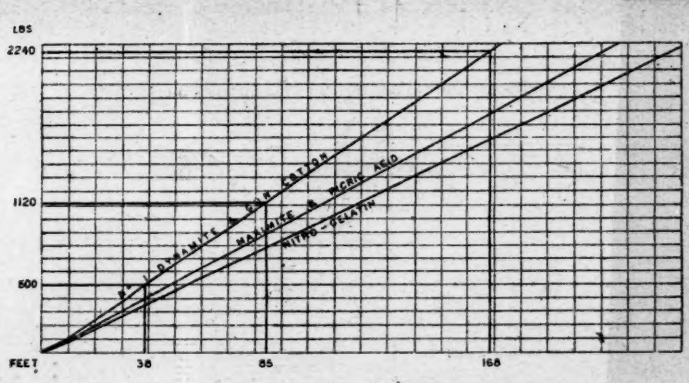


Table showing distances at which different high explosives will exert through water, a pressure of 12,000 lbs. to the square inch, and destroy the strongest battle-ship.

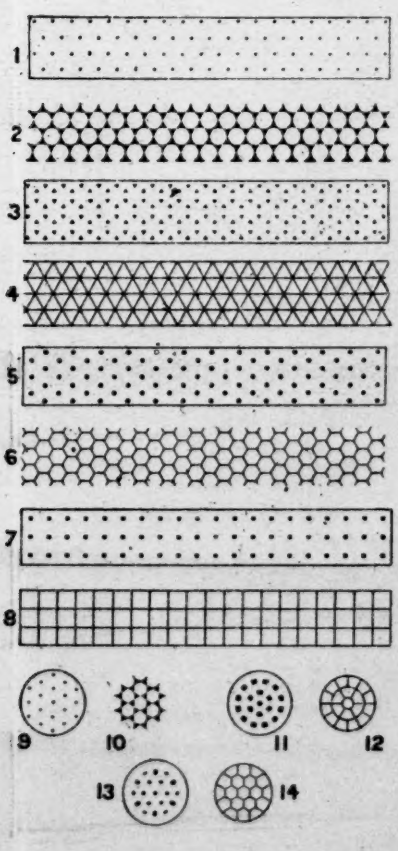



DIAGRAM No. 14.